Spring 2004

Mental accounting psychology and life cycle economics: Who saves, who doesn't and how to tell the difference

Thomas James Van De Water IV.
University of New Hampshire, Durham

Ph.D. DISSERTATION

MENTAL ACCOUNTING PSYCHOLOGY AND LIFE CYCLE ECONOMICS: WHO SAVES, WHO DOESN'T AND HOW TO TELL THE DIFFERENCE

BY

THOMAS JAMES VAN DE WATER IV

BA SUNY Geneseo, 1992

MA University of New Hampshire, 1996

MBA University of New Hampshire, 1998

DISSERTATION

Submitted to the University of New Hampshire

In Partial Fulfillment of

The Requirements for the Degree of

Doctor of Philosophy

In

Psychology

May, 2004

This dissertation has been examined and approved.

Dissertation Director, Ellen S. Cohn
Professor of Psychology

Victor Benassi
Professor of Psychology

Rebecca Warner
Professor of Psychology

Andrew Smith
Director of the UNH Survey Center

Stephen Ciccone
Assistant Professor of Accounting and Finance

5/13/04
Date

This dissertation is dedicated to:

Thomas and Carol, my parents, who motivated me to begin a Ph.D. and

Alyson, my wife, who motivated me to finish

ACKNOWLEDGEMENTS

I would like to thank Ellen Cohn for her diligent and consistent efforts on my behalf over the past ten years. Without your help and guidance this would not have been possible. The input of my committee members: Victor Benassi, Becky Warner, Andy Smith and Stephen Ciccone, who provided equal parts insight and patience, has also proven invaluable. Finally, I would like to recognize the University of New Hampshire for providing the opportunity, and teaching fellowship support, to study in Durham, NH.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABSTRACT

MENTAL ACCOUNTING PSYCHOLOGY AND LIFE CYCLE ECONOMICS:

WHO SAVES, WHO DOESN'T AND HOW TO TELL THE DIFFERENCE

by

Thomas James Van De Water

University of New Hampshire, May, 2004

Wealth is often associated with status purchases or belonging to a demographic group instead of a cognitive decision process for saving and accumulating wealth. Mental accounting psychology (Kahneman & Tversky, 1979; Shefrin & Thaler, 1988) and life cycle economics (Modigliani & Brumberg, 1954) describe two different saving processes. Qualitative interviews in Study 1 (adult heads of household, n=24) and a quantitative analysis in Study 2 (2001 Survey of Consumer Finances, n=4,332) compared high and low saving people using mental accounting and life cycle variables. Interviews in Study 1 predominantly described saving in terms of short-term, mental accounting heuristics that separated assets and provided self-control for spending. Participants did not report a life-cycle saving process that pooled assets, rationally allocated wealth over time or set a long-term, optimal spending level. Study 2 also supported mental accounting indicating high and low net worth individuals differed in the number of separate asset accounts, debt aversion and expertise in converting income into less liquid current and future assets. These findings point toward an expanded role for mental accounting in interdisciplinary research, financial education, and national saving programs.

INTRODUCTION

The American success story has become the American excess story. A pervasive "you are what you buy" consumerism (Dittmar, 1992; Lunt & Livingstone, 1992; Schor, 1998; Wolkomir & Wolkomir, 2002) has contributed to unprecedented household debt and bankruptcies (Sullivan, Warren & Westbrook, 2000). Yet, there are some who live below their means and save. For example, Mary Hutto, a teacher, lived frugally and slept in the hallway of her student boarding house so all the rooms would have tenants. Raised during the Depression and never earning a high income, she saved and invested, believing she would not have enough on which to live. She donated $3.5 million to fund a scholarship at her alma mater (Portsmouth Herald, September 28, 2001). In a culture that champions spending, why are these people different? What characteristics identify and distinguish those with a propensity to save and accumulate wealth versus those who do not?

This research examines characteristics that separate people into meaningful groups with different levels of saving. First, economic and psychological literature related to decision making and saving will be reviewed. Next, two studies will be presented. The first was a qualitative study that explored a select group of individuals' experiences, approaches and rationales for saving. The second was a quantitative secondary analysis of the Federal Reserve's 2001 Survey of Consumer Finances that examined which variables separated those who saved from those who did not.

CHAPTER I

SAVING DECISIONS:

MENTAL-ACCOUNTING PSYCHOLOGY AND LIFE-CYCLE ECONOMICS

Social scientists have developed models to describe and predict saving decisions. Traditionally, studies on saving were conducted by economists. Saving research has recently become more interdisciplinary. While most saving research has been based on economic theory, psychological concepts, theories and methods have been applied more widely. The overall movement in both decision-making and saving models has been that an individual's decision to save is increasingly viewed as subjective and strongly influenced by psychological factors.

Economists have conceptualized discretionary personal saving as a life-cycle function of fungible wealth and age (Modigliani & Brumberg, 1954). Over the bell-shaped age-income profile, people pool income, assets and future income and set consumption to a permanent income across periods (Friedman, 1957). The young borrow, the middle-aged save, and the elderly dissave. Rothschild (1991) paraphrased the economic view as, "savings are ways of purchasing future consumption" (p. 128). This approach deductively prescribes saving decisions for a rational individual who optimizes personal utility according to demographic characteristics (age, income), external constraints (interest rate, ability to borrow) and objective standards (outcome probability, dollar value). It is a normative account of how people should behave. There is

considerable evidence for aggregate life-cycle relations *between* age and income groups (Modigliani, 1985). In cross-sectional and panel data, saving levels are lowest among youth, highest among the middle aged and decreasingly smaller for elderly cohorts (e.g., Browning & Lusardi, 1996; Deaton, 1992).

Life-cycle economics have not accounted for all of the variation in saving, though. Unexplained variation still exists *within* matched age and wealth cohorts (e.g., Kennickell 1995; Venti & Wise, 1991). People with similar demographic characteristics (age, income, families, etc.) often save drastically different amounts. It is also not clear that people consciously and rationally solve a complex, multi-period optimization problem to allocate their spending (Thaler, 1995). Saving decisions involve additional psychological factors (e.g., attitudes, beliefs, memory, recall) and subjective information processing prone to heuristics, biases and irrationality (Kahneman & Tversky, 1979; Thaler, 1990).

Social-cognitive psychology is based largely within an information-processing paradigm (Fiske & Taylor, 1991; Simon, 1982). This approach describes psychological processes inductively with empirical experiments. The psychological approach assumes neither rationality nor optimization (Ajzen, 1996). It is a descriptive account of how people actually behave. According to the psychological approach, saving decisions undergo cognitive framing as a gain/loss from a subjective reference point (Kahneman & Tversky, 1979, 2000) and mental accounting across age and wealth levels (Shefrin & Thaler, 1988). Saving decisions are influenced by topical cognitive representations susceptible to framing effects (Tversky & Kahneman, 1981, 1986). How a decision is described and represented directs it to a mental account (Thaler, 1985). This can occur by

a budgeting process (establishing consumption categories like food, rent, etc.), location of the funds (checking, saving, pension) or source of income (regular or windfall). Three mental accounts have been proposed with different marginal propensities for consumption (MPC): current income (MPC=1), assets (0<MPC<1) and future income (MPC=0). Saving occurs if the choice is framed and directed to accounts with a low propensity for consumption (Thaler, 1999). In other words, people control spending by separating assets and using heuristics.

Subjectivity has increased in both the decision-making and saving literatures. Saving models have moved from measuring saving economics with objective demographic variables toward measuring saving psychology with subjective variables. Empirical research has generally shown: (a) people tend not to rationally weigh all options and select only optimally beneficial choices; rationality is bounded (Simon, 1982), (b) people minimize cognitive effort by using heuristics prone to error (Kahneman, Slovic & Tversky, 1982), and (c) people often arrange wealth into separate mental accounts to provide self-control and simplify financial decisions and the mental account balances frame subsequent decisions to spend or save (Shefrin & Thaler, 1988). In other words, as saving decisions become more relative, psychology becomes more relevant.

Models of Decision Making: Increasingly Subjective

The movement from objective demographic measures to subjective psychological measures can be seen in the evolution of mathematical models of decision-making. The original models of decision-making under risk (probabilities of success are known or estimated) and uncertainty (probability of success is unknown) arose from

mathematicians who studied games of chance (Gigerenzer et al., 1993). A model was constructed with assumptions to define and predict how an individual would act and new models evolved due to unexplained anomalies of the current theory. Today's models have roots in the 17th century. Building on the legal tradition of contracts, mathematicians questioned what constituted a fair exchange or contract to wager on an uncertain outcome. Christiann Huygens proposed in the mid 1600s that a fair game was characterized as a game in which the expectations would work to no one's disadvantage. Expectation, then translated into a fair price to play given an outcome with a certain probability of occurring (Gigerenzer et al., 1993). This concept was later represented mathematically as:

E=p(e)V	E	=Expectation
	p(e)	=Probability of event
	V	=Outcome value

This representation was extended into Expected Value theory (EV) which proposed that the expectation of a monetary gamble was a weighted average and each possible outcome was weighted by the probability of its occurrence (Gigerenzer et al., 1993). For example, given a lottery with 1,000 tickets and a $10,000 prize, what is the fair price (expectation) to play this lottery? According to EV, the expectation would be E=p(e)Vwin + E=p(e)all losses. In this case, there is one winner among 1,000 entries making the probability of winning 1/1,000 and the value of the outcome is $10,000. The other 999 entries will lose with a probability of 999/1,000 and the value of this outcome is $0. When the formula E=p(e)V is applied to the win outcome the expectation equals $10, and when applied to all the loss outcomes the expectation is zero. Therefore, when

all the expectations for all possible outcomes (both losses and wins) were summed the total expectation to play this lottery was $10 (Gigerenzer, et al. 1993; Lopes, 1994).

Daniel Bernoulli in 1738 observed that the value of money was relative to the individual, and he conceived of the subjective value of money as utility (Gigerenzer et al., 1993). For example, a millionaire might view a potential gain of $1,000 as inconsequential whereas a poor person might view a $1,000 gain as a windfall. Bernoulli also thought that the reason behind people's risk aversion might lie in the subjective evaluation of money or utility. To describe utility mathematically, Bernoulli proposed that utility could be characterized by a concave, logarithmic function. The effect of this logarithmic function was that it compressed higher values, so that money has a diminishing marginal utility (i.e., differences between larger values have less impact than the same differences for smaller values). For example, the difference in utility between $200 and $100 is greater than the difference in utility between $1,200 and $1,100. People's preferences between gambles could then be described in terms of the gamble's expected utility. Expected utility theory (EU) also described why people were risk averse for a probabilistic outcome with a higher objective outcome value because this value had less utility. For example, in the previously mentioned choice between gambles with an .85 chance to win $1,000 versus a 100% chance to win $800, the $800 would have a higher utility than the $1,000 due to the logarithmic function (Gigerenzer, et al. 1993, Lopes, 1994).

Expected utility theory was extended by Von Neumann and Morgenstern's mathematical axioms in their 1947 book, Theory of Games and Economic Behavior. The title illustrates extensions beyond games of chance into wider economic decisions. These

authors assumed a rational decision-maker whose choices among risky gambles would consistently follow normative axioms. Von Neumann and Morgenstern (1947) proposed that preferences could be summarized by the concave utility function of money that Bernoulli described, and that these preferences could be modeled as if the person always chose to maximize expected utility. One axiom that was proposed was invariance. Invariance prescribes that the preference order among gambles should not depend upon how they are described, or variations in the problem's form that do not affect the final outcome should not affect choice (Kahneman & Tversky, 1984; Tversky & Kahneman, 1986). For example, when asked to choose the greater term when the problem was described as A>B or when the problem was described as B<A, the rational decision maker who seeks to maximize utility follows the invariance axiom and chooses A in both cases.

An implication of this treatment of EU was that if people seek to maximize utility, then their preferences should be linear to the outcome probabilities. In other words, people should always prefer the highest probability option. This assumption of linearity mandates both a constant difference (a difference in probabilities translates into an equivalent difference in subjective utility) and a constant ratio (the ratio of probability and utility are one to one). However, in the 1950s Maurice Allais proposed a set of paradoxical situations that countered these assumptions. Allais' paradoxes essentially observed that preferences were not linear with probability. He observed that people prefer certain things disproportionately to outcomes with a very high probability (e.g., 100% vs. 90% chance), and that people preferred more impossible things if it appeared to improve the outcome (e.g., .001 chance for $1 million vs. .01 chance for $50) (Lopes, 1994).

Kahneman and Tversky (1979) experimentally demonstrated that people did not follow the invariance axiom in their choices. They discovered that if a problem was described as a gain or a loss, it differentially affected or framed people's subsequent choices. For example, this was seen in the following problems from Kahneman and Tversky (1979) where the percentage of people choosing the option is in brackets:

Win frame	A. +$3,000 p=.90 [86%]	Lose frame	A. -$3,000 p=.90 [8%]
	B. +$6,000 p=.45 [14%]		B. -$6,000 p=.45 [92%]

In the win frame, this pattern of preferences demonstrated risk aversion away from the higher-value, lower-probability outcome. However, in the lose frame, there was an opposite pattern for risk seeking to prefer the higher-value, lower-probability outcome. These counter examples to EU illustrated that EU focused on describing the outputs of risky choices and did not explain a psychological process underlying these choices.

In contrast, Prospect theory (PT) proposed a psychological process underlying both violations of linearity and invariance (Kahneman & Tversky, 1979). A prospect is a contract that yields outcome X with probability P, and is denoted as (x, p). To describe the psychological process underlying decision making, Kahneman and Tversky proposed that there were two phases in choosing among risky prospects. The first stage was termed editing or framing and consisted of encoding information as a gain or loss from the current status quo or reference point. The second stage was known as evaluation, and it occurred when the edited prospects were examined and the one with the highest value was selected.

A central tenet of PT was that individuals evaluated risky decisions from a relative reference point, and that the subjective value of the outcome was described as an S-shaped function around the reference point. Based upon people's preferences in

experiments, Kahneman and Tversky proposed a hypothetical value function that was concave for gains ($v''(x)<0$, for $x > 0$) and convex for losses ($v''(x)>0$, for $x < 0$) and that it was steeper for losses than for gains. The origin was the reference point and there was diminishing sensitivity to differences farther away from the reference point. An implication of this new approach was that people are loss averse. Because the value function was steeper for losses than for gains, it implied that a loss of $10 was more aversive than a gain of $10 was attractive.

Another tenet of prospect theory was that probability perceptions are subjective and described by a non-linear transformation of objective probabilities using the decision weight π. The decision weight was described as an increasing function of probability such that: if $p=0$, then $\pi(p)=0$ and if $p=1$, then $\pi(p)=1$. The discontinuities of π at the endpoints demonstrated there was a limit to how small a decision weight could be attached to an event, so π was not well behaved at the endpoints. As a result of the non-linear decision weights, there was a category boundary effect at the probability endpoints (i.e., certain events 95-100%, and improbable events 0-5%):

In this way, PT predicted certain behaviors (risk aversion or risk seeking) as a function of how the problem was described. Descriptions of the problem in Kahneman and Tversky's (1986) experiments varied the outcome and whether the problem was phrased as a loss or a gain. For example, students were asked to indicate which of two medical treatments for lung cancer they preferred in choice problems. Preferences changed by manipulating a problem's wording as a gain or loss, "The advantage of radiation therapy over surgery evidently looms larger when stated as a reduction of the risk of immediate death from 10% to 0% rather that as an increase from 90% to 100% in

the rate of survival" (Tversky & Kahneman, 1986, S255). This problem illustrated the loss aversion predicted by PT's value function as well as the shift in preferences predicted by non-linear decision weight transformations of probability at the endpoints. Formally, PT for a choice between two prospects is stated as:

$V(x,p : y,q)$	$= \pi (p)\, v(x) + \pi (q)\, v(y)$
V	= overall value of prospect
$(x,p : y,q)$	= x with probability p and y with probability q
v	= subjective value of particular outcome
π	= decision weight

In informal terms, PT shifted the mathematical expression of decision making toward greater dependency on the subjective value as a gain or loss.

Overall, models of decision-making under risk and uncertainty have become increasingly relative over time by adding subjective value terms. Expected value (EV) with the addition of a subjective valuation of money became expected utility (EU). Expected Utility then led to prospect theory (PT) with a subjective probability term and valuation from a relative reference point as a gain or loss.

Economic Models of Saving

Similar to decision making, saving research has incorporated more subjective elements into theory. Early analytic descriptions of saving have a strong psychological trait flavor (Shefrin & Thaler, 1988). Saving is described as a function of personality (Fisher, 1930), motivation / habit (Keynes, 1936), and social-comparison (Duesenberry, 1949). However, these factors are not incorporated into formal models. Macroeconomic accounts of saving arise from a consumption function. Browning and Lusardi (1996) observe, "Although the theory is sophisticated and flexible, it is a theory of consumption;

saving is simply the residual between income and current consumption" and that "most of the empirical work on saving itself is descriptive and relatively atheoretical." (p. 1798). More recent models of saving have not only cited the influence of psychological factors, but also included these factors in saving decision models.

Fisher (1930) stated saving requires foresight, self-control, habits, expectation of life and desire to leave things for posterity. Saving is a multi-period exercise that requires rational decisions, planning for the future and developing good habits (Mayer, 1972). Fisher's (1930) consumption function can be summarized as:

$$C = C(Y,r)$$

C = consumption

Y = annual income

r = interest

Thus, consumption was a function of income and interest. Savings (S) were unconsumed annual income or $S = Y - C$. However, saving was dynamic and a central assumption was positive time preference, meaning that the value derived from future consumption was less than the same consumption now. Household saving as a result requires intertemporal optimization of consumption. The household could lend some of its present income to increase future consumption or borrow from its future income to increase present consumption. By limiting consumption today, households received it back with interest later so that future income was an endowment of $Y + (1+r)S$. Borrowing from the future negated saving (-S). In a simple two-period model, the intertemporal optimization problem was:

$$\max U(C_1, C_2)$$

s.t.

$$C_1 + C_2/(1+r) \leq Y_1 + Y_2/(1+r)$$

U = expected utility

C_x= consumption in period x

Y_x= endowment in period x

Within this framework, the rational decision maker was constrained to ensure the present value of consumption streams did not exceed the present value of income streams discounted at the rate of interest 1+r. Saving theories must also explain why people did not save. For Fisher, low-income households did not save because the pressure of supplying current wants overwhelmed concern for the future. The desirability of present consumption relative to the future was greater than the lost interest. The gain from saving (or loss from not saving) was the interest rate and peoples' choices illustrated their time preference.

Keynes (1936) proposed a series of motives for saving. These motives included: creating reserves for unplanned events (precautionary), creating reserves for planned future needs (life-cycle), gaining interest (intertemporal substitution), gaining greater spending capacity (improvement), financial freedom/power to do things (independence), invest in business (enterprise), leave things to others (bequest) and pure miserliness (avarice). However, Keynes' (1936) absolute income theory shifted the focus to current period consumption. This simple consumption function can be expressed:

$$C = C_0 + cY$$

Consumption increased with income, but not in equal proportion because of habit persistence. People accustomed to a lower standard of living have consumption habits that persisted when their incomes improved creating savings. Savings were thereby a

residual of consumption (Mayer, 1972). Conversely, low-income households had no residuals from habitually spending available income.

Duesenberry (1949) proposed that consumption increased in step with rising income but people had difficulty reducing consumption equally when income fell:

$$C = C_0 + c_1 Y + c_2 Y^M$$

Y^M = maximum consumption achieved in the past

Duesenberry's relative income theory also posited a social-comparison aspect to saving. Personal consumption was influenced by comparison to previous personal consumption and one's neighbors. Low-income households had a higher propensity to consume and did not save as they emulated their higher income neighbors (Mayer, 1972). Overall, these models focused on income at a certain point in time and did not account for future income or other assets. Wealth models added these factors.

The wealth models of saving were independently proposed by Nobel memorial prize laureates and included the life-cycle (Modigliani & Brumberg, 1954) and permanent income (Friedman, 1957). Both theories adhered to the normative paradigm of a rational consumer optimizing utility within a set of constraints. Breaking with the focus on current income, the life-cycle hypothesis and permanent income theory widened the perspective to wealth over time. The life-cycle hypothesis general claim was that when making consumption decisions, households looked beyond the current period and distributed consumption to maximize utility across a lifetime. Modigliani (1985) stated saving "could be accounted for in terms of rational, utility maximizing, consumers

allocating their resources to consumption optimally over their life" and that "the size of saving over short periods of time, like a year, will be swayed by the extent to which current income departs from average life resources" (p.299). Modigliani's (1985) simple consumption function was:

$$C = \alpha YL + \delta W$$

C = Consumption during a short-term period

α, δ = Demographic parameters (length of life (age), retirement)

YL = Income

W = Wealth

In the life-cycle hypothesis, individuals rationally estimated future wealth to optimize spending. If income exceeded the long-term level of life resources (Modigliani & Brumberg, 1954) or permanent income (Friedman, 1957), saving occurred. In aggregate, this consumption function can be represented:

$C_t = cV_t$

C_t = consumption at time t

c = aggregate demographic characteristics

V_t = sum of assets, income and all expected future earnings at time t

Current consumption was an annuity based on the present value of current income, net assets and expected value of future income. Over the bell-shaped age-earnings profile, people smoothed consumption to a constant level. The allocation depended upon demographic characteristics (age, income, uncertainty, etc.). With financial markets, people shifted endowments over different time periods to smooth consumption while income varied. As the estimated future income stream rose, people would borrow. If

expected future income was declining, people would save. This optimization problem could be stated as follows where time t spans t = 0 to t = T, the end of one's life:

$$\max U = \sum_t \beta^t U_t(C_t)$$

s.t.

$$\sum_t C_t/(1-r_t)^t \leq A_0 + \sum_t Y_t/(1-r_t)^t$$

β^t = subjective time discount rate

A_0 = wealth at birth

A rational household allocated intertemporal consumption by the discounted value of its wealth (assets, current income and expected future income), the interest rate and its preference for present versus future consumption (Deaton, 1992; King, 1985; Mayer, 1972). This was limited by an intertemporal budget constraint of all discounted future income and wealth.

Since Hall (1978), most empirical and theoretical saving research primarily has used the Euler equation for dynamic optimization and estimated the parameter for utility with the Constant Relative Risk Aversion (CRRA) non-quadratic, iso-elastic utility function. Consumption was described as:

$v(C, \mathbf{Z})$

C = consumption

Z = vector of demographic factors that affect household utility

The combined Euler equation and CRRA were stated in Browning and Lusardi (1996) as:

$$\Delta \ln C_{t+1} = \tilde{\beta} + \tilde{\alpha} \Delta \mathbf{Z}_{t+1} + \phi r_t + 0.5\phi\sigma^2_{t+1} + \mu_{t+1}$$

γ = coefficient of relative risk aversion

ϕ = subjective interest rate coefficient = $1/\gamma$ (> 0 or positive to account for concavity)

$\tilde{\beta}$ = subjective discount factor = $\phi \ln(\beta)$

$\tilde{\alpha}$ = subjective changes in demographics factor = $\alpha(\gamma - 1)/\gamma$

σ^2_{t+1} = subjective consumption shock variance

and $\mu_{t+1} = -\phi\,(e_{t+1} - 0.5(e_{t+1} - \sigma^2_{t+1}))$

so that $E_t(\mu_{t+1}) = 0$

In this model there were an increased number of terms and these terms were increasingly specific to the individual (i.e., subjective / relative). Personal risk aversion (γ) was added. The real interest rate was modulated by a person's response to anticipations of interest (ϕ). Time discounting (β) or patience / impatience for consumption varied according to the individual. Anticipated changes in demographics (α) such as family size were subjective and had an independent effect. Consumption shock variances (σ^2_{t+1}) such as major medical expenses were factored into the model relative to the individual along with variance in the information available in time t (e_{t+1}). The saving motives of Keynes could be ascribed to different terms. For example, the life cycle motive corresponded with changes in demographics (α), and precautionary and intertemporal substitution motives corresponded to expectations of interest rates (ϕr_t) (Browning and Lusardi, 1996).

Life-cycle theories carry a series of simplifying assumptions. Browning and Lusardi (1996) summarized these assumptions as the certainty equivalence model, "Agents have intertemporally additive utility functions and face perfect capital markets. Either there is perfect certainty or agents maximize expected utility; they form rational expectations and have quadratic utility functions" (p. 1801). These assumptions have

empirical implications. A change in wealth (ΔW) should create a corresponding proportional change in consumption. Substitutions in the category of wealth (current income, assets, or future income) should have no effect on consumption. Wealth is treated equally and interchangeably; i.e., wealth is fungible. Also, people should have the same marginal propensity to consume (MPC = proportion of incremental dollar spent versus saved) wealth from each category. The shape of the lifetime consumption profile should be a constant proportion of permanent income affected only by age, interest rates and family lifetime wealth. Life-cycle consumers possess strong self-control to modulate consumption to the permanent income level and consumption is valued equally during every period. With no bequest motive, consumers gear consumption to end life with zero wealth balance. Consumer non-borrowing was due to external market liquidity constraints; i.e., lending institutions refuse loans. Finally, the consumer was assumed to be sophisticated and capable of solving a complex optimization problem (Thaler, 1990; Thaler, 1999). Recent models retain life-cycle elements, but relax the assumptions. Standard additive models assume uncertainty, imperfect capital markets and non-quadratic utility functions to accommodate a precautionary motive, liquidity constraints, buffer stocks, habits, satiation and durable goods (Browning & Lusardi, 1996; Deaton, 1999).

To summarize, macroeconomic consumption functions set different maximization problems for rational agents to save. These functions have grown more complex as terms were added to account for subjective factors people optimize in their decisions. Keynes' (1936) reference for optimization was current income. Fisher (1930) referenced current income and the interest rate. Life cycle (Modigliani & Brumberg, 1954) and permanent

income (Friedman, 1957) agents reference current income, net assets, expected future income and subjective time discounting based on demographic characteristics. These factors have received the most attention in saving theories, and there is support for aggregate life-cycle allocation patterns in the general population. For example, Kennickell's (1995) examination of the 1992 Survey of Consumer Finance supported the life-cycle tenets of households smoothing consumption and declining savings with age. Tin (2000) observed that demographics were relevant for predicting levels of savings in financial institutions for transaction, precaution and speculation. Saving was strongly associated with wealth and the inequality in savings rates closely parallels wealth inequality (Kennickell, 2001). This pattern of age and income effects on saving was also supported by international research in Canada, Italy, Germany, Japan and the United Kingdom (Poterba, 1994). In sum, a voluminous literature supported age and income effects on saving (see Browning & Lusardi, 1996; Deaton, 1992). Life-cycle factors were robust indicators of a group's economic capability to save.

However, Thaler (1992) wryly observed:

> The modern theories of saving have made the representative consumer increasingly sophisticated. Expectations are taken to be the same as those which would be held by a sophisticated econometrician. The problem seems to be that while economists have gotten increasingly sophisticated and clever, consumers have remained decidedly human. This leaves open the question of whose behavior we are trying to model. (p. 121)

Schmidt-Hebbel and Serven (1999) similarly noted:

> If all individuals were identical in all dimensions related to saving decisions (behavior, endowment, and restrictions they face), then aggregate saving would be trivially related to individual saving – it would just equal the saving of a representative agent multiplied by the population. To determine society's total saving, it would suffice to know the values of the representative agent's income, wealth, and so on. In other words, given the total population, aggregate saving would depend only on the aggregate values of variables such as income and wealth. If individuals are instead heterogeneous, however, this simple relationship ceases to hold. (p. 147)

Macroeconomic saving models have become more relative to the individual, their current state and their perception of future states. In this evolution, the traditional assumptions of a homogeneous, rational agent and optimization have been questioned.

While there was strong support for aggregate life-cycle allocation patterns, the evidence does not strongly indicate individuals rationally optimize at the micro level according to the life-cycle model. Bernheim and Shoven (1991) note that despite many government programs aimed at increasing saving, saving rates have decreased steadily in the U.S. "The 1980s provided a humbling experience for economists and policy makers alike. Certainly we learned many lessons about the economy, but foremost among them was the realization that we still understand very little about the factors that motivate people to save." (p. 2). There are strong cohort effects (Attanasio, 1994), gender effects (Hinz, McCarthy & Turner, 1997; Sunden & Surette, 1998), international differences in saving (Collins, 1991; Schmidt-Hebbel & Serven, 1999) and differences by education and race (Attanasio, 1994). An individual's saving psychology appears to reflect the

processes of perception, memory, information processing and choice. The next section reviews growing empirical support for psychological factors' influence on saving decisions.

Psychological Models of Saving

Similar to the decision-making literature, there are empirical anomalies for macroeconomic saving theories (Thaler, 1992). A change in wealth does not always create a corresponding change in consumption. Large lump-sum bonuses have a higher rate of saving versus small windfalls (Landsberger, 1966). The shape of the lifetime consumption profile was not always a constant proportion of permanent income (Carroll & Summers, 1991). The retirement plans of the middle aged do not decrease savings in other areas. These are perceived and treated as illiquid and often prompt increased saving (Venti & Wise, 1987). The elderly do not dissave housing equity (Skinner, 1989; Venti & Wise, 1989). Consumers do not possess strong self-control to modulate consumption (Thaler & Shefrin, 1981). Consumption was shown to be hypersensitive to current income (Hall & Mishkin, 1982; Wilcox, 1989) and most consumers do not have any discretionary saving (Attanasio, 1994; Kennickell, Starr-McClure & Surette, 2000; Venti & Wise, 1991). Furthermore, consumption appears not to be weighed equally during every period. The timing of income and payments affects consumption and saving choices (Prelec & Lowenstein, 1998). Self-imposed, internal rules to not finance consumption through debt (debt aversion) may provide a better description of consumer non-borrowing than liquidity constraints (Thaler, 1990). People often can borrow to finance consumption to a higher level, but do not. Finally, consumers may act as if they are capable of solving complex optimization problems, but most do not. Anomalies such

as the endowment effect's underweighting of opportunity costs (Kahneman, Knetsch & Thaler, 1990; Thaler, 1980), myopic loss aversion (Bentarzi & Thaler, 1995), disposition effect (Odean, 1998) and the diversification heuristic (Thaler & Bentarzi, 2001) would not occur if consumers rationally used decision algorithms (see also Thaler, 1992).

Prospect theory has been readily applied to economic anomalies (Camerer, 2000). Thaler (1980) integrated prospect theory into saving decisions:

> we must consider the individual's psychic accounting system. To do this it is necessary to introduce a psychic equivalent to debits and credits which for lack of better terms, I will call pleasure and pain. In terms of prospect theory, pleasure can be thought of as the value function in the domain of gains while pain corresponds to the value function in the domain of losses. (p. 278)

Tversky and Kahneman (1981) extended Thaler's idea of a psychological account as an outcome frame specifying outcomes and how they were evaluated from a status quo reference point. It was re-termed as a mental account:

> Our analysis of framing and of value can be extended to choices between multiattribute options, such as the acceptability of a transaction or a trade. We propose that, in order to evaluate a multiattribute option, a person sets up a mental account that specifies the advantages and disadvantages associated with the option, relative to a multiattribute reference state. The overall value of an option is given by the balance of its advantages and its disadvantages in relation to the reference state. Thus, an option is acceptable if the value of its advantages exceeds the value of its disadvantages. This analysis assumes psychological - but not physical – separability of advantages and disadvantages. The model does not

> constrain the manner in which separate attributes are combined to form overall measures of advantage and of disadvantage, but it imposes on these measures assumptions of concavity and of loss aversion. (Kahneman & Tversky, 1984, pp. 11-12)

Thaler (1999a) expanded the term mental accounting "to describe the entire process of coding, categorizing, and evaluating events" (p. 244). Beliefs and expectations were vulnerable to question formulation effects. This occurs during the editing or framing phase in prospect theory. Kahneman and Tversky (1984) theorized that information was organized in a minimal account, a topical account or a comprehensive account. A minimal account takes into consideration only the differences between options and not shared features. A topical account considers a reference state and the consequences of the options on that reference state. Finally, a comprehensive account provides the widest context into which options are placed.

Ideally, people will rationally form a comprehensive account that treats an option as an example of a larger class, gather data and compare the current option to the class (Kahneman & Lovallo, 1993, Russo & Schoemaker, 1989). Kahneman and Tversky (1984), however, claimed "people will spontaneously frame decisions in terms of topical accounts that, in the context of decision making, play a role analogous to that of 'good forms' in perception and of basic level categories in cognition" (p.347). Based on the topical account frame, people made subsequent evaluations as gains and losses from this reference point. Framing did not affect a minimal account nor a comprehensive account. In this way, the social context was cognitively translated through editing and evaluation to frame a decision.

To address saving anomalies, Shefrin and Thaler (1988) proposed an alternative approach to saving called the behavioral life-cycle hypothesis. The behavioral life-cycle hypothesis conceptualized a personality conflict between an emotional short-term doer and rational long-term planner. The temptation of immediate consumption from the doer required conscious effort by the planner to resist. As a result, consumers adopted rules of thumb that decreased conscious effort. For example, an external self-control rule is a mandatory pension plan that precommits income and eliminates choices. Though not always optimal, these rules are simple, stable and allow few exceptions.

The behavioral-life cycle hypothesis drew from Kahneman and Tversky's ideas on framing and mental accounts. Consumers divided wealth into mental accounts with differing marginal propensities to consume. The three accounts Shefrin and Thaler (1988) propose were: current income (MPC approximately 1), assets ($1 > MPC > 0$) and future income (MPC approximately 0). Mental accounts framed consumption decisions: "we assume that the temptation to spend a (marginal) dollar of wealth depends on the location of that dollar in the mental accounting system, with current income being the most tempting, followed by current assets, and then future wealth" (Shefrin & Thaler, 1988, 616). Once established, transactions are grouped and posted to these accounts. People coded external information about outcomes (hedonic framing) according to the value function of PT (e.g., segregating gains, integrating losses). Subsequently, the experienced outcome is actively edited (hedonic editing) from these entries (Thaler, 1999).

In formal terms, the behavioral life-cycle hypothesis defined self-control as the determining factor for saving. The utility to myopically consume immediately was

countered by varying degrees of willpower (θ_t). Given an opportunity set X_t, the level of consumption (c_t) were a function of willpower (Shefrin & Thaler, 1988).

$$\theta^*_t (c_t, X_t)$$

θ^*_t = willpower

c_t = consumption

X_t = opportunity set

Willpower decreased the utility of the doer's consumption (Z_t) and required energy to maintain over time. The cost of will power effort at the margin was:

$$\delta Z_t/\delta\theta_t \cdot \delta\theta^*_t/\delta c_t$$

The net marginal cost of using will power (D) was the difference between a decrease in consumption utility with and without willpower:

$$D = (\delta Z_t/\delta\theta_t \cdot \delta\theta^*_t/\delta c_t) - \delta Z_t/\delta c_t > 0$$

The behavioral life-cycle proposed a mental three account system with a pension rule that deducts some proportion of income (s) for saving and references the balance of each account. The balances of the current income, current wealth (cumulative discretionary savings through period $t-1$) and future wealth accounts were defined by Shefrin and Thaler (1988) as:

Current income account = I $= (1-s)\, y_t$

s = proportion of income deducted for saving

y_t = income stream for period t

Current wealth account = A $= \sum_{T}^{t-1} [(1-s)\, y_T - c_T]$

Future wealth account = F = (future income – pension withdrawals) $+s(\sum y_{t*})$

$s(\sum y_{t^*})$ = pension wealth

Shefrin and Thaler (1988) stated that utility (Z_t) is parameterized by the choice set (X_t) of current income (I), current assets (A) and future income (F) account balances and that the relationship between utility, will power and consumption within a mental accounting structure can be graphed as $Z_t(c_t, \theta^*_t, X_t)$ against c_t. Consumption from current income increased utility with diminishing returns as the balance reaches zero. When the first unit of the asset account was consumed there was an entry fee, or disutility penalty followed by a slow increase in utility as the asset account reaches zero. Future income accounts were the last to be accessed and incur an entry fee followed by the smallest increase in utility. For aggregate prediction, the behavioral life cycle consumption function was based on the three mental accounts:

$$C = f(I, A, F)$$

The accounts were related according to the following inequality:

$$1 \sim \delta C/\delta I > \delta C/\delta A > \delta C/DF \sim 0$$

The marginal propensity to consume the current income account was closest to 1 and greater than the current asset and future income account.

Compared to the economic saving literature, psychological saving research is limited in size and scope. Kahneman (2003) stated that for many academics, this research was viewed as "professional suicide":

> Although behavioral economics has enjoyed much more rapid progress and gained more respectability in economics than appeared possible 15 years ago, it is still a minority approach ... But many bright young [researchers] are now betting their careers on the expectation that the current trend will last for some time (Kahneman, 2003, 729).

A sample of empirical studies over two decades show framing and mental accounting affect saving. Pre-commitment devices such as 401k or IRA plans reduce self-control required to save and provide self-imposed rules that are simple, stable and allow few exceptions to segregate wealth and make it non-fungible (Gaerling, Karlsson & Selart, 1999; Thaler, 1980, 1985, Thaler & Shefrin, 1981). Accordingly, there has been considerable evidence that 401k and IRA plans represent new saving and not just reshuffling of assets (Poterba, Venti & Wise, 1994; Venti & Wise, 1991). Labeling a transaction and posting to a mental account can affect decisions. For example, the difference between cash and credit card prices are termed cash discount instead of credit card surcharge based on this principle (Thaler, 1980). Investments that are viewed as "in the red" (losers) are less likely to be sold than those "in the black" (winners) (Odean, 1998; Shefrin & Statman, 1985) when a rational approach would dictate the opposite. Prelec and Lowenstein (1998) illustrated preference changes shifted toward consumption or saving depending on whether outcomes are viewed as single or sequential. Differential framing effects similarly occurred for sequences that offer increasing utility for gains (best at end of sequence) and losses (worst at beginning of sequence). The temporal order and coupling of payments to a mental account also affected saving (Prelec & Lowenstein, 1998). Increased time and decoupling of payment and consumption minimized the pain of payment.

In an effect they term the money illusion, Shafir, Diamond & Tversky (1997) showed people represent transactions in simple nominal terms (original dollar values) rather than real terms (original value plus inflation). Nominal representations of money cloud judgments on the value of saving as well as choices between investment options

when inflation is factored. For example, wine connoisseurs were presented a choice of selling or drinking a bottle of wine bought for $20 that is now worth $75. Only 20 percent evaluated the replacement cost of drinking the wine at $75. Others considered drinking the wine free (30%) or a savings of $55 (25%) (Shafir, Diamond & Tversky, 1997). While an economic motivation explanation was offered for this example by Mackenzie (1997), it was readily apparent that people represented replacement costs differently. In another example of cognitive representation effects, Thaler and Bentarzi (2001) illustrated that selections among retirement plans rely on a $1/n$ heuristic. When offered n funds to choose from, employees diversified contributions evenly across the choices. Choice bracketing has been shown to affect decisions, and Thaler and Johnson (1990) showed a preference to combine losses with a larger gain. The body of research has provided practical guidance for increasing saving. For example, 401k plans precommit by a simple rule a sequence of contributions offering long-term gain decoupled from the payment (i.e., a pre-paid nest egg to enjoy in retirement). This plan is considered a good deal by experts, requires minimal effort, rewards saving (tax incentives or employer matching) and was generally treated as future income off limits to current spending (Thaler, 1994).

Reference points and loss aversion have also been a particular focus for applications of prospect theory in financial decision making (Camerer, 2000; Kahneman & Tversky, 2000). Prospect theory stated that the carriers of value were not absolute states of wealth but changes in wealth evaluated from a reference point (Kahneman & Tversky, 1979). For example, Kahneman, Knetch, and Thaler (1990) have illustrated that loss aversion and framing from the status quo can result in an anomaly termed the

endowment effect. A person who bought a bottle of wine for $10 that is now worth $200 will neither sell the bottle for $200 nor will they replace the bottle if it breaks for $100.

Building from such economic anomalies, a recent model has incorporated reference points and loss aversion with saving (Bowman, Minehart & Rabin, 1999). Extending the economic insights of Duesenberry (1949), Bowman, Minehart and Rabin (1999) recognized that past spending helps set reference levels for current spending. Previous spending provides a reference point and subsequent changes to this level of spending were influenced by loss aversion. Under conditions of future income uncertainty, people given bad news about the future demonstrated risk seeking over the perceived loss (resisted lowering spending). Behavioral evidence also indicated people given good news about the future became risk averse (resisted raising spending). Because losses loom larger than gains, the resistance to lower spending with bad news was greater than the resistance to raise spending with good news across economic data from five countries. These results were contrary to rational economic theory, but correspond well with loss aversion (Bowman, Minehart & Rabin, 1999).

Wells (2001) presented another saving model partially derived from prospect theory (Kahneman & Tversky, 1979). Integrating economic (life-cycle: Modigliani & Brumberg, 1954) and psychological theories (theory of planned behavior: Ajzen, 1985; mental accounting: Shefrin & Thaler, 1988), Wells (2001) created a saving measurement instrument and analyzed with a LISREL structural equation model. The results indicated two significant mental accounting dimensions (having a current situation / short-term focus and making decisions with unexpected windfalls or large sums) mediated saving intentions (Wells, 2001).

As noted earlier, most studies of mental accounting phenomena have consisted of empirical experiments, small sample demonstrations or large sample studies that test economic theory and offered an alternative mental accounting explanation (Thaler, 1999). A smaller number of studies have tested for mental accounting and taken a more descriptive, psychological approach using larger, nationwide data sets. A recent study by Chaulk, Johnson and Bulcroft (2003) used the 1998 SCF of 4,309 households to predict the effect of family stage (marriage and children) upon individuals' propensity to take financial risks following prospect theory (Kahneman & Tversky, 1979). The authors theorized that occupying a particular family stage influenced the framing of risk options affecting investment selections among low risk savings accounts to higher risk stocks. The findings indicated households with children generally demonstrated a lower tolerance for risk (Chaulk, Johnson & Bulcroft, 2003).

In sum, there has been strong evidence for aggregate life-cycle allocation patterns between groups. Saving corresponded predictably with the hump shaped age-earnings profile. However, even among wealthy households, who had the highest rate of saving, these relationships were not absolute. For example in Kennickell's (1995) analysis, participants with net worth below $10,000 reported spending more than income (18.6%), the same as income (41.2%) or less than income (40.2%). These same categories were also represented in households with net worth in excess of $1,000,000 spending more than income (12.2%), the same as income (4.0%) or less than income (83.8%). While it was readily apparent the wealthy save more, it was also apparent that variance remains within both groups. Some low-income households managed to save and some wealthy households overspent. Similar within-group variation was found in age groups, cohorts

and even among those matched by age, wealth and career (e.g., Stanley & Danko's, 1996 example of Dr. North and Dr. South). Attanasio (1994) has succinctly stated the problem, "While the characterization of saving *levels* ... can be translated directly into significant information about aggregate saving, the microeconomic behavior underlying these aggregates deserves to be analyzed further.... Individual saving rates are very noisy almost by construction" (p. 111).

Mental accounting (Thaler, 1999) and prospect theory (Kahneman & Tversky, 1979) described a psychological process for within-group, micro-level variation in saving. Prospect theory illustrated a psychophysics of chance and choice derived from a relative reference point. Mental accounting proposed a cognitive ledger for wealth with different propensities to consume depending on account. Mental accounting explanations of saving also conformed to the concept of bounded rationality (Simon, 1982). Intense cognitive effort was necessary to consciously track and derive maxima for uncertain factors such as interest rates and future earnings to a permanent income basis. To bridge the demands of an uncertain environment and costs to obtain information, people should prefer satisficing (a level of aspiration that provides satisfaction) to maximization. Economic anomalies and personal accounts of saving decisions (e.g., Kennickell, Starr-McCluer & Sunden, 1996) also indicated that people did not experience saving decisions as rationally solving an intertemporal optimization problem.

The descriptive account of saving decisions diverged from the normative model by embedding psychological factors within a micro-level process (Bell, D. Raiffa, H. & Thaler, 1980; Tversky, A., 1989; Tversky & Kahneman, 1986). People's reference points were partially determined by the objective status quo (e.g., demographics such as age and

income), but reference points also incorporated expectations, beliefs, the nonlinear decision weights (risk seeking/aversion at ends of probability distribution) and social context (Kahneman, 1992; Kahneman & Tversky, 1984).

In conclusion, this section has presented a parallel in the decision-making and saving literatures. Theories of decision making and saving have transformed over time to incorporate more subjective terms. Mathematical models of these behaviors have grown in complexity to better capture unexplained heterogeneous individual variation. As models of saving behavior became more relative, psychology became more relevant.

Separating Who Saves From Who Does Not

While the literature on decision-making and saving has incorporated psychological factors, most applied saving research generally divides people into saving groups along demographics or life-cycle hypothesis concepts. These divisions have assumed saving occurs relative to the age / income profile or life cycle position. For example, the Department of Labor's 2002 National Summit on Retirement Savings created four age-based saving groups: Millenial Generation (<20), Generation X (20-30+), Baby Boom (40-50+) and the Silent Generation (60-70) (Department of Labor, 2002). Other studies on American saving have focused upon a particular age (AARP, 1999) or a particular income/wealth group (Stanley & Danko, 1996; Wolff, 2000). Campbell and Mankiw (1991) divided populations in the United States and other countries into savers who are forward looking and smooth consumption according to the life-cycle hypothesis and spenders who spend all current income up to their liquidity constraint. In another study, Weil (1991) proposed that the population consists of non-savers, forward-looking savers and non-forward looking savers who are wealthy.

International saving classifications have similarly used life-cycle demographics and concepts of wealth, income and precautionary buffer stock. Babeau (1981) divided the French population into people who only needed storage of money, people who wanted storage of money and to maintain a buffer for emergencies, people with many needs that saved as a precautionary measure for the future, and wealthy people who are well informed and maintained many types of investments. Burbridge and Robb (1985) studied elderly savers in Canada and created two groups: blue-collar savers who conformed to life-cycle hypothesis and white-collar savers who did not. Lindqvist (1981) used a hierarchy of saving motives to divide Swedes into four groups. The groups were: cash managers who had a high need for liquidity, buffer and security savers who prepared for unknown future needs, goal savers who saved to acquire things they cannot afford in one period and wealth managers who sought to increase wealth through investments rather than postponing consumption. In another study on Swedes, Wahlund and Gunnarsson (1996) used people's debt-to-asset ratio (DTA) to create groups. Six groups were created: residual savers who preferred liquid savings and to carry debt (DTA=1.0), contractual savers who had high debt and save by paying it off (DTA=4.2), security savers who invested heavily in retirement financial instruments (DTA=1.3), risk hedgers who put wealth in more risky investments (DTA=0.52), prudent investors who put wealth in less risky investments (DTA=0.28), divergent strategists who diversified wealth in complex portfolios (DTA=0.50) (Wahlund & Gunnarsson, 1996).

In sum, selecting variables to divide savers from non-savers requires understanding current models of decision making and saving. The variables that influence saving and how they interact are most clearly specified in the notation of mathematical

economic and psychological saving models. To date, demographic variables have provided a quick and objective way to classify a population into saving groups. Saving has been mostly predicted, studied and reported through demographic categories (age, income, family size, etc.). Also, not surprisingly, because studies on saving until recently were conducted only by economists, the terms used to create saving groups were predominantly extrapolated from life-cycle concepts (wealth, precautionary buffer stocks, smoothing consumption, forward time-discounting, etc.). Although macroeconomic studies have validated aggregate life cycle saving trends (Modigliani, 1985), life cycle models have not consistently described micro-level household savings (Browning & Lusardi, 1996; Thaler, 1994) nor predicted whether an individual will save above or below their means:

> Macroeconomic predictions have often failed during the last decades.... Some economists suggest that descriptions and explanations at less aggregated levels are necessary for arriving at better explanations and predictions. There is then a quest for something like the market segment concept (Warneryd, 1999 p36)

Mental accounting studies primarily occur in small group experiments or demonstrations. Mental accounting has also been used to provide an alternative explanation to the life-cycle hypothesis in large samples (e.g., Bernheim, Skinner & Weinberg, 2001) and to provide models for consumer saving (e.g., Bowman, Minehart & Rabin, 1999; Wells, 2001). However, nationwide studies that separate savers and non-savers by mental accounting have not been conducted on a scale similar to economics. If saving variation, is related to mental accounting psychology then saving classifications must include variables beyond demographics.

Research Question

The fundamental question of this research was what characteristics can be used to separate savers from non-savers beyond demographic variables? As described earlier, models of decision making and saving have shifted from objective, demographic variables toward subjective, psychological variables. Saving models now cite a larger number and variety of individual difference variables. In economics, subjective perceptions of risk, interest rates, discount factors, consumption shocks and changes in demographics were incorporated (Browning & Lusardi, 1996). Life cycle models (Modigliani & Brumberg, 1954) proposed a rational process that pooled income, assets and future income and optimized spending across one's lifespan to a permanent income level (Friedman, 1957). In psychology, mental accounts, heuristics, reference points and perceptions of gain and loss were incorporated (Shefrin & Thaler, 1988). The behavioral life cycle (Shefrin & Thaler, 1988) saving model based upon prospect theory (Kahneman & Tversky, 1979) suggested saving occurs through short-term, mental-accounting heuristics that separated income, assets and future income and provided spending self-control.

Yet, despite the increased reliance upon psychological variables in saving models, these factors have not been used to describe saving in the population. Groups have not been formed or reported according to risk perceptions or discount factors. Current studies and reports of saving have relied upon demographics like age and income or generational stereotypes (baby boomers, generation X, millenials, etc.) to broadly characterize groups. As seen in Table 1, the economic and psychological theories suggested very different characteristics to identify and separate savers from non-savers in a population. While life

Table 1
Life cycle and Mental Accounting Profiles of When and How Saving Occurs

Characteristic	Life cycle	Mental Accounting
Use of debt	Maximize to smooth spending Externally limited by market	Minimize; debt aversion Internally limited by person
Income	Income > permanent income	Any income
Age	Middle age	Any age
Cognitive process	Rationally set spending level	Heuristics control spending
View of assets	Pool assets	Separate assets
Time horizon	Long-term, lifetime	Short-term, current situation
Influenced by	Bequest, Precautionary motives Consumption shocks/catastrophe	Current situation, heuristics Asset labels, experiences
Saving varies by	Differing demographics	Differing self-control

cycle economic factors have been used, mental accounting psychology factors have not been used.

Two studies were conducted to determine what additional psychological factors could be used to identify successful saving. The first was qualitative and designed to elicit first-hand, detailed rationales for saving. The second was a quantitative secondary analysis of the 2001 Survey of Consumer Finances designed to analyze how well psychological variables separated low versus high saving groups.

CHAPTER II

STUDY 1

To better understand what separated savers from non-savers, it was necessary to first explore the interplay of life cycle demographics and mental-accounting psychology at a personal level. There has been remarkably little qualitative research on individuals' saving experiences and thought processes (Kennickell, Starr-McCluer, Sunden, 1996; Warneryd, 1999). Most saving studies have also examined raw saving levels (net worth, assets or wealth) in a sample (Browning & Lusardi, 1996). Raw savings, however, do not necessarily indicate how proficient a person was at accumulating wealth for their age and income. To determine who was successful at saving, wealth needed to be scaled for age, income and inheritance. The present study addressed these concerns and explored three questions to lay groundwork for what variables to use in identifying and separating people who save from people who do not in Study 2.

First, to what extent did self-depictions of saving differ among households whose savings are above and below what would be expected for their age and income? Stanley and Danko (1996) set a benchmark to scale wealth as age multiplied by income less inheritance divided by 10. A shorthand way to calculate this was age divided by ten times income less inheritance. At age 20, a person should have a net worth two times their income, at 30 three times, at 40 four times and so forth. When this number was compared to a household's net worth, a family could be categorized as high or low saving. For example, a 50 year-old earning 50,000 with a net worth in excess of 250,000 would be

high saving and less than 250,000 would be low saving. Would people whose savings were high or low versus expectation give different accounts of saving?

Second, were there common themes across demographics (age, income, etc.) and saving level (high/low) in how people described their savings process? Self-depictions of saving as pooling assets and rationally setting a permanent or long-term spending level would support the life cycle or permanent income hypothesis (Modigliani & Brumberg, 1954; Friedman, 1957). Self-depictions of saving using heuristics to separate assets and provide short-term, spending control would support mental accounting (Shefrin & Thaler, 1988). What factors specified in the saving theories influenced all groups?

Third, to what extent did people across demographics and saving levels report influences outside the life cycle (Modigliani & Brumberg, 1954) and mental accounting models of saving (Shefrin & Thaler, 1988)? In particular, would people cite emotion, personality or motivation as key reasons for saving? Was there an ethical or moral rationale for saving? Were social influences such as peers, upbringing, and experiencing or witnessing a financial catastrophe influential? What factors not specified in the saving theories influenced all groups?

Method

Participants. This study included 24 heads of households who were actively saving or inclined to save. Fourteen participants were men and 10 were women. Ages ranged from 23 to 77 ($M = 41.9$, $SD = 14.1$). The sample contained 23 White and 1 Black respondents. Most of the participants were married (18). The rest of the sample was either never married (5), or widowed (1). Fifteen had one or more children. The participants

were primarily college educated (21). Detailed demographic information about each participant is displayed in Table 2.

Sample Selection. A convenience sample was obtained by referral or acquaintance with the researcher. The sample was selected to contain a variety of ages and a mixture of males and females. Using Stanley and Danko's (1996) scale for wealth as a guide, the sample was also selected according to whether the net worth as estimated by the researcher was greater or less than would be expected for their age and income. Twelve people whose estimated net worth was above expectation (high saving) and 12 people whose estimated net worth was below expectation (low saving) received a telephone solicitation to participate. Everyone who was solicited volunteered.

Materials. Five closed-ended questions and response choices from Section J of the Survey of Consumer Finances were used to examine participants' saving habits, previous year's spending, the length of time people plan for financially (time horizon), the amount of risk people were willing to undertake with investments (risk tolerance), and perceived financial luck. Next, three fill-in demographic questions (age, occupation, sex) added by the researcher were included. Distributed through the rest of the interview were five researcher questions regarding personal saving rationales; how saving was defined, moral reasons for saving, why others save or not, and saving strategies. To further probe saving rationales, the interview also included focus group questions from Kennickell, Starr-McCluer and Sunden (1996) regarding saving reasons, what was saved for, perceived future obligations, planning for saving and sources of information used for saving/investment decisions. Finally, three follow-up probes to the question "What do you think of when I say saving" asked participants whether they felt saving is primarily

Table 2
Study 1: Demographic Profiles of Interview Participants

Case	Age	Sex	Married	Kids	Group[a]	Education	Occupation
1	36	M	Married	0	High	College	Financial advisor
2	56	M	Married	1	High	College	Retired teacher
3	59	M	Married	2	High	Some College	Business owner
4	33	F	Married	0	High	College	Sales manager
5	62	M	Married	1	High	College	Retired engineer
6	77	M	Widowed	1	High	College	Business owner
7	34	M	Single	0	Low	College	College professor
8	35	F	Single	0	Low	College	Marketing assistant
9	31	F	Married	1	Low	College	Financial advisor
10	32	M	Single	0	Low	College	Biomedical engineer
11	33	M	Married	0	Low	College	Software developer
12	53	M	Married	3	Low	College	Financial manager
13	47	F	Married	1	Low	College	Entrepreneur
14	39	F	Married	1	High	College	Marketing director
15	57	M	Married	3	High	College	Retired dentist
16	54	F	Married	0	High	College	Secretary
17	26	F	Single	0	Low	College	Web designer
18	33	M	Married	2	High	College	Business owner
19	56	M	Married	2	High	High School	Retired entrepreneur
20	36	M	Married	3	High	College	Business owner
21	33	F	Married	2	Low	College	Homemaker
22	23	M	Single	0	Low	College	Envir. engineer
23	29	F	Married	1	Low	Some College	Quality manager
24	30	F	Married	1	High	College	Homemaker/student

[a]High = savings > age/income expectation, Low = savings < age/income expectation

internal/external, stable/unstable and controllable/uncontrollable for an individual. These dimensions correspond to two kinds of attributions; a person attribution for behavior caused by consistent, internal traits and a situation attribution for behavior caused by temporal, external factors (Trope, 1986). The categorizations essentially asked respondents whether they felt others' saving was due to a trait or a state. The topic and source of each interview question is displayed in Table 3.

The conversation was recorded using Digital Loggers, Inc. Personal Logger V-1.5.64/05/13/03 software and an RJ-11 "Y" connector for telephone handsets. The sound level indicator on the Personal Logger interface was monitored to ensure voice capture during the interview. The Personal Logger creates a digital audio file that was given a case number and stored for transcription. Each interview was replayed and typed from the audio file using Microsoft Windows Media Player v8.0. The interview text was numbered sequentially at each conversation transition to allow for easy reference to sections of the interview. The original digital files were then written to a compact disc for permanent storage.

Procedure. An informed consent form (Appendix A) and a personal interview question sheet (Appendix B) were sent to each participant. The structured personal interview was delivered by telephone. Each interviewee was solicited by telephone to participate using the first 5 sentences of the description on the informed consent form (Appendix A). If the participant agreed, a consent form and question sheet was sent. Upon return of a signed informed consent form, a date and time for the telephone interview was arranged.

Table 3
Study 1: Sources for Interview Questions

Question	Topic	Source
1	Saving habits	Survey of Consumer Finances Q741
2	Last year's spending	Survey of Consumer Finances Q743
3	Planning horizon	Survey of Consumer Finances Q739
4	Risk tolerance	Survey of Consumer Finances Q740
5	Lucky in financial affairs	Survey of Consumer Finances Q1608
6	Age	Researcher
7	Occupation	Researcher
8	Sex	Researcher
9	Saving definition	Researcher
10	Reasons for saving	Kennickell, Starr-McClure & Sunden (1996)
11	Moral / ethical reasons	Researcher
12	Why people save or not	Researcher
13	What was saved for	Kennickell, Starr-McClure & Sunden (1996)
14	Future expenses	Survey of Consumer Finances Q735
15	Plan for savings	Kennickell, Starr-McClure & Sunden (1996)
16	Saving strategies	Researcher
17	Personal saving influences	Kennickell, Starr-McClure & Sunden (1996)
18	Risk and saving	Kennickell, Starr-McClure & Sunden (1996)
19	Changes to saving approach	Kennickell, Starr-McClure & Sunden (1996)
20	Events that influence saving	Kennickell, Starr-McClure & Sunden (1996)
21	Saving information sources	Kennickell, Starr-McClure & Sunden (1996)
22	Conclusion	Researcher

The interview itself consisted of a brief overview of the project, reiterating the consent form's introduction. When the participant was ready, the researcher signaled that recording was about to begin and also reminded the interviewee not to self-identify during the recording. This was followed by questions read from the question sheet in order with limited, unscripted probing. Interview times ranged from 15 minutes to 46 minutes lasting 24 minutes on average ($M = 24.5$, $SD = 8.8$). In return, participants were given a comparison of their saving attitudes versus the average responses of Americans to five matched items on the 2001 Survey of Consumer Finances. Participants were treated in accord with the University of New Hampshire's and American Psychological Association's guidelines for research with human subjects.

Coding Procedure. The interview questions were coded thematically following Richie and Spencer's (1994) qualitative data process known as framework analysis (see also Pope, Ziebland, & Mays, 2000). Framework analysis consists of five distinct steps: familiarization, identify a thematic framework, indexing, charting, and mapping / interpretation. Familiarization consists of personally transcribing and reading the interviews. Second, a thematic framework is identified that can contain both a priori and emergent themes. Third, indexing is applying the framework to the data with codes. Fourth, charting is using the framework headings to tally data by theme and by case. Finally, mapping and interpretation is examining the chart for patterns, associations and concepts. The data codes were then entered from the printed interview sheets into SPSS v11.5 for frequency analysis. To check the validity of the codes, another survey researcher independently recoded the 24 interview transcripts, and the interrater reliability was good ($r = .93$).

Results

Twenty-four qualitative interviews were conducted to explore three questions:

1) Do self-depictions of saving differ between households who save more versus less than expected for their age and income? [*group differences*]

2) Do people across groups describe their saving process as long-term and rational or short-term and heuristic? [*saving process description*]

3) Is saving influenced by factors not explicit in either life cycle or mental accounting theories? [*additional saving factors*]

Group differences in saving.

Many previous studies have explained American saving by demographic characteristics such as age, race, education and income (e.g., Kennickell, 2001; Department of Labor, 2002). An analysis has not been done to investigate the effect of what people actually save on a benchmark scaled to age multiplied by income less inheritance divided by 10 (Stanley & Danko, 1996). As mentioned in the procedure, two groups of 12 were formed for comparison based upon an estimate of whether the household's net worth was greater than this benchmark (*high saving)* or less than this benchmark (*low saving).* Despite considerable similarities, subtle differences between the high and low saving groups were observed in the qualitative interviews.

A one-way ANOVA of group (high vs. low saving) was conducted to test for a difference in age. The high saving group (M = 49.5, SD =14.8) was significantly older (F (1, 23) = 9.56, p = .005) than the low saving group (M = 34.3, SD =8.3). The high saving group also tended to have a larger number of children (M = 1.4, SD = 1.0) versus the low saving group (M = 0.7, SD = 1.0) but this difference was not significant. While both

groups were similarly educated, the high saving group was almost exclusively married (11) versus the low saving group (7). Frequencies for age, marital status, education and children are displayed in Table 4.

Table 5 displays frequencies for saving habits, spending, time horizon and risk tolerance. A two (high vs. low saving) by three (next few years, next 5-10 years, longer than 10 years) Pearson chi-square test was performed on planning time horizons by saving groups saving habits (put money aside regularly, save one income/spend other, no plan). The distribution of planning time horizons for below and high saving groups was not significantly different (χ^2 (2) = 0.157, p = .925). Most participants reported having a time horizon for planning savings and investments of more than 10 years (17) followed by the next few years (5). A similar Pearson chi-square test was performed on saving habits (put aside money regularly, save one income/spend other, no regular plan) versus saving group (high vs. low saving). The high and low saving groups were nearly identical in reported saving habits and planning time horizons. For both groups, the predominant saving habit was to save regularly by putting aside money each month (20) followed by no plan/save leftover (3) and this difference was not significant (χ^2 (1) = 3.733, p = .292).

One-way ANOVAs of group (high vs. low saving) were also performed on saving habits and acceptable risk levels. While everyone in the high saving group reported spending less than income in the previous year (12), versus the low saving group (9), this difference was not significant (F (1, 23) 3.13, p = .082). The groups also did not significantly differ in preference for risk (F (1, 23) 3.67, p = .069).

The high and low saving groups reported relatively similar reasons for saving and these differed slightly depending upon the time period: past saving, current saving and

Table 4
Study 1: Participant Age, Marital Status, Education and Children Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Age					
> 35	11	5	6	8	3
35-44	4	2	2	2	2
45-54	3	1	2	2	1
55-64	5	5	-	-	5
65-74	-	-	-	-	-
<=75	1	1	-	-	1
Marital Status					
Married	18	10	8	7	11
Separated	-	-	-	-	-
Divorced	-	-	-	-	-
Widow	1	1	-	-	1
Not married	5	3	2	5	-
Education					
No high school diploma	-	-	-	-	-
High school diploma	1	1	-	-	1
Some college	2	1	1	1	1
College degree	21	12	9	11	10
Children					
0	9	5	4	7	2
1	8	3	5	3	5
2	4	3	1	1	3
3 or more	3	3	-	1	2

Table 5
Study 1: Saving Habits, Spending, Time Horizon and Risk Tolerance Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Saving habits					
Don't save, spend>income	-	-	-	-	-
Don't save, spend=income	-	-	-	-	-
No plan, save leftover	3	1	2	2	1
Save 1 income, spend other	-	-	-	-	-
Save other income	1	-	1	1	-
Save regularly, put aside	20	13	7	9	11
Last year's spending					
Spending > income	2	1	1	2	-
Spending = income	1	-	1	1	-
Spending < income	21	13	8	9	12
Planning time horizon					
Next year	-	-	-	-	-
Next few years	5	4	1	3	2
Next 5-10 years	2	1	1	1	1
Longer than 10 years	17	9	8	8	9
Risk willing to take					
Substantial	1	1	-	1	-
Above average	6	4	2	4	2
Average	15	8	7	7	8
No financial risk	2	1	1	-	2

future saving. As seen by the frequencies for past saving and saving planning in Table 6, both the high and low saving groups' past saving was directed at buying similar things for themselves: house (15), car (11), vacation (6), other purchases (6), contractual debts (5), wedding (3). Those in the high saving group also tended to report deliberately planning their savings (9) more frequently versus low saving (4). The low saving group was more likely to say they decided as things came up (5) or both (3). A 2 (high saving, low saving) x 3 (plan, no plan, both), Pearson chi-square test was performed; however, and this difference was not significant (χ^2 (1) = 4.79, p = .091).

Frequencies for current saving reasons in Table 7 indicated that both groups again cited the same reasons in the same order: emergencies / security / unexpected needs (17), retirement / old age (10), "for the children / family; help kids" (7) and buy durable goods / things when wanted or needed (4). The frequencies of future saving obligations illustrated in Table 8 also indicated that the groups perceived the same top three future financial obligations: children's education (11), retirement (11) and home repairs / improvements (6). Future saving items reported tended to be for family and retirement self-sufficiency. However, the high saving group differed slightly by including in the scope of future financial obligations health care for spouse / self / others (4) and a personal business (4). Overall, the high and low saving groups were fairly similar in their assessments of past, current and future saving. Past saving was directed at buying things and displayed what Browning and Lusardi (1996) term a down payment motive. Current saving was largely precautionary. Future saving was directed toward life cycle expenses. One difference between the groups was evident in the frequencies for financial luck. On a five point rating scale for perceived luck in financial affairs, a one-way ANOVA

Table 6
Study 1: Past Saving and Saving Planning Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
What have you saved for in past (multiple response)					
Children's education	6	5	1	2	4
Own/spouse's education	2	1	1	1	1
For children/help kids	1	1	1	2	-
Wedding/other ceremony	2	-	2	1	1
To have kids/family	2	1	1	1	1
Buy own house	15	9	6	6	9
Buy second house	1	1	-	1	-
Buy car/boat/vehicle	11	7	4	5	6
Home improvement/repair	2	1	1	1	1
Travel, take vacations	6	2	4	2	4
Other purchases	6	3	3	3	3
Charitable/religious gifts	1	1	-	-	1
To enjoy life	1	1	-	-	1
Buy/invest in own business	4	4	-	-	4
Retirement/old age	6	2	4	3	3
Emergencies/unexpected	1	-	1	1	-
Investments	4	3	1	2	2
Commitments, debt, taxes	5	5	-	2	3
Advance living standard	1	1	-	1	-
Living expenses/bills	1	1	-	-	1
Deliberately plan savings					
Deliberately plan	13	11	2	4	9
Decide as things come up	6	2	4	5	1
Both	5	1	4	3	2

Table 7
Study 1: Reasons for Saving Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Children's education	1	-	2	1	1
Own/ spouse's education	-	-	-	-	-
For children/family; help kids	7	3	4	5	2
Buying own house	-	-	-	-	-
Buy a car, boat or vehicle	-	-	-	-	-
Home improvements/repairs	-	-	-	-	-
To travel; take vacations	1	-	1	-	1
Buy goods; other purchase	4	3	1	2	2
Charitable/religious gift	1	1	-	-	1
To enjoy life	2	1	1	2	-
Investing in own business	-	-	-	-	-
Retirement/old age	10	6	4	4	6
In case of unemployment	1	-	1	1	-
In case of illness	1	1	-	1	-
Emergencies; security	17	10	7	8	9
Investments	1	1	-	-	1
Commitments – repay debt	-	-	-	-	-
Advance standard of living	3	3	-	1	2
Ordinary expenses/bills	1	1	-	1	-
For the future	1	1	-	1	-
Wise/prudent thing to do	-	-	-	-	-
Liquidity; to have cash	-	-	-	-	-

Table 8
Study 1: Financial Luck and Perceived Future Obligation Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Luck in financial affairs					
Agree Strongly	8	5	3	2	6
Agree Somewhat	10	6	4	5	5
Neither Agree/Disagree	4	3	1	3	1
Disagree Somewhat	1	-	1	1	-
Disagree Strongly	1	-	1	1	-
Future obligations saving for (multiple response)					
Children's education	11	5	6	6	5
Own education; spouse	2	1	1	2	-
Health care self/spouse	3	1	2	-	3
Health care others	1	-	1	-	1
Support self/retirement	11	5	6	6	5
Support child	5	4	1	2	3
Support parents	1	1	-	1	-
Support others	1	-	1	-	1
Buy home	3	1	2	3	-
Buy car/durable goods	2	-	2	1	1
Home repair/improve	6	4	2	3	3
Weddings, vacations, etc.	1	1	-	1	-
Business; start/expand	3	3	-	-	4
Investment	3	3	-	1	2
Bills/living expenses	4	2	2	2	2

showed the high and low saving groups were significantly different (F (1, 23) 5.57, p = .028). The high saving group rated their financial luck higher than the below average group.

Table 9 illustrated frequencies for saving information sources. The information sources used by each group to make saving and investment decisions were similar with a few exceptions. The younger, low saving group was more likely to report using the Internet (3) and material from work or work contacts (5). The high saving group preferred personal research (10) and reading (5). Surprisingly, both groups reported a similar reliance upon friends / relatives and professionals (lawyers, accountants, brokers, financial planners).

Table 10 illustrated frequencies for the definition of saving, categorization of saving versus investing and saving attributions. When asked whether saving and investing were different, there was a clear difference between the high and low saving groups. A 2 (investing/saving same, investing/saving different) x 2 (high/low saving), Pearson chi-square test was performed. The high saving group was significantly more likely to equate saving and investing than the low saving group (χ^2 (1) = 5.042, p = .025). For example, one high saving respondent replied, "I would say saving is a type of investing – or investing is a type of saving" (respondent 24, female, high saving). Both the high and low saving groups also defined saving primarily as an action: putting money aside / away, not spending, or allocating resources. The attributional patterns of high and low saving groups were almost identical and showed a preference for internal, stable and controllable attributions across groups.

Table 9
Study 1: Saving and Investment Information Source Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Information sources used (multiple response)					
Call around	1	1	-	1	-
Magazines/newspapers	8	5	3	3	5
TV/radio	2	1	1	-	2
Online/Internet	3	2	1	3	-
Friend/relative	10	5	5	5	5
Lawyer	1	1	-	-	1
Accountant	4	2	2	1	3
Banker	-	-	-	-	-
Broker	7	3	4	4	3
Financial planner	4	1	3	2	2
Self/personal research	13	8	5	3	10
Material from work/contacts	5	3	2	5	-
Investment seminars	1	1	-	-	1

Table 10
Study 1: Saving Definition, Saving vs. Investing, Saving Attribution Frequencies

Question	Frequencies of				
	All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Saving definition (multiple response)					
Put money aside/away	12	6	6	6	6
Not spending/conserving	5	4	1	3	2
Plan/allocate resources	2	2	-	1	1
Bank/money/retirement	7	3	4	3	4
Security, unforeseen event	2	-	2	1	1
Saving same as investing					
No	17	10	7	11	6
Yes	7	4	3	1	6
Saving internal/external					
Internal	16	12	4	9	7
External	2	-	2	1	1
Both	6	2	4	2	4
Saving stable/unstable					
Stable	16	9	7	8	8
Unstable	6	4	2	3	3
Both	2	1	1	1	1
Saving controllable/not					
Controllable	19	12	7	9	10
Uncontrollable	1	-	1	-	1
Both	4	2	2	3	1

In Table 11, response frequencies are displayed for a perceiving a moral obligation to save and the reasons given for why other people save or do not. The high and low saving groups uniformly cited a moral obligation to save and used similar categories to describe this obligation. The only descriptive difference in response frequencies was that the high saving group was slightly more likely to mention duty as family provider. When asked why others saved or not, both groups again gave similar answers. A notable difference was that the high saving group cited having a high income as a reason for others' saving (3) while the low saving group cited desire / priority / mindset (6), self-control / delaying gratification (4) and long time horizons (7).

Both the high and low saving groups consistently reported using mental accounting heuristics as seen in the frequencies for different saving strategies in Table 12. The low saving group was more inclined to cite the need for spending discipline (9) and used heuristics to make money inaccessible (5) like 401k tax shelters (5) and automatic payroll deduction (5). The high and low saving groups were also very similar in experiences that were cited as influential and in risk perceptions as seen by response frequencies in Table 13. Some notable exceptions were that only high saving group mentioned working / saving early in life (5) and a religious influence (3). Further, the groups were evenly matched in their assessment of risk's influence on their savings approaches. Both high and low saving groups cited that current age, comfort level and having a strategy/plan affects their assessment of risk.

Finally, frequencies displayed in Table 14 illustrated high and low saving groups reported similar changes in their saving approaches over time. While four members of the high saving group and one in the low saving group reported their saving approach had not

Table 11
Study 1: Moral Saving Obligation and Why Others Save or Do Not Save Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Why feel moral obligation to save (multiple response)					
Not to be dependent/burden	7	5	2	4	3
Duty as family provider	12	9	3	4	8
Religious share/steward gifts	3	-	3	2	1
Wrong to be wasteful	3	1	2	1	2
Why other people save (multiple response)					
Desire/priority/mindset	9	5	4	6	3
Can afford, high income	3	1	2	-	3
Upbringing/family	8	6	2	3	5
Self-control/delay gratification	4	3	1	4	-
Security/peace of mind	3	1	2	3	-
Long time horizon	9	5	4	7	2
Peers/spouse/social influence	1	-	1	1	-
Conservative personality	4	3	1	1	2
Why others do not save (multiple response)					
No desire, not priority	2	1	1	2	-
Can't afford, low income	5	1	4	4	1
Not in upbringing/family	3	2	1	1	2
Lack education/knowledge	5	3	2	4	1
No control/impulsive	8	6	2	4	4
Lack mental/planning ability	4	3	1	1	3
Short time horizon	10	4	6	7	3
Non-saver personality	2	1	1	-	2
Hardship medical/financial	4	2	2	2	2
Peers/spouse/social influence	3	2	1	1	2
Procrastinate/future better	2	2	-	1	1

Table 12
Study 1: Saving Strategy Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Strategies to put aside money (multiple response)					
Tax shelter, 401k, 403b, SEP	8	2	6	5	3
Calculate goal cost, divide up	8	6	2	4	4
Spending discipline	12	7	5	9	3
Create separate accounts	6	5	1	2	4
Make money inaccessible	6	4	2	5	1
Set goals, separate want/need	4	3	1	3	1
Adjust savings to income	3	2	1	1	2
Personal heuristic, informal	13	7	6	5	8
Budget, plan	6	3	3	3	3
Save unspent income	5	2	3	1	4
Automatically deduct from pay	8	4	4	5	3
Save windfalls, endowments	2	1	1	1	1
Minimize debt, pay in cash	3	2	1	2	1

Table 13
Study 1: Personal Saving Influences and Influence of Risk Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Experiences/circumstance/personality influences on saving (multiple response)					
Poverty, debt, bankruptcy	9	4	5	4	5
Upbringing, family	14	7	7	7	7
Running a business	2	1	1	1	1
Working/saving early in life	5	3	2	-	5
Conservative personality	9	5	4	4	5
Hardship medical/financial	1	1	-	1	-
Peers/spouse social influence	3	2	1	3	-
Income level	2	1	1	1	1
Marriage/kids, family transition	2	1	1	1	1
New/lost job, career transition	3	1	2	2	1
Witness others' hardship	2	-	2	2	-
Religious influence	3	2	1	-	3
Divorce	1	1	-	-	1
Attain goal/item to purchase	2	1	1	-	2
Risk influence saving (multiple response)					
Risk averse, low tolerance	5	3	2	2	3
Risk seeking, high tolerance	8	6	2	3	5
Seek moderate risk level	3	1	2	2	1
Lower risk by strategy/plan	10	4	6	6	4
Current age affects risk	13	10	3	5	8
Comfort level affects risk	9	5	4	5	4
Wealth level affects risk	1	1	-	1	-
Family affects risk	3	1	2	1	2
Adjust risk to situation	8	5	3	3	5

Table 14
Study 1: Changes in Saving Approach Frequencies

Question	Frequencies of All (n=24)	Male (n=14)	Female (n=10)	Low (n=12)	High (n=12)
Did saving approach change					
Changed	19	10	9	11	8
Has not changed	5	4	1	1	4
How saving approach changed (multiple response)					
Less risk, more conservative	8	6	2	2	6
More risk, more aggressive	1	1	-	-	1
Save more	8	2	6	8	-
Save less	1	1	-	1	-
Alter spending habits	4	3	1	1	3
Save for different things	1	-	1	1	-
Alter saving habits	1	-	1	-	1
Events that changed approach (multiple response)					
Running a business	2	2	-	-	2
Education/courses/advisement	8	7	1	3	5
Hardship medical/financial	5	3	2	2	3
Peers/spouse social influence	3	3	-	1	2
Income level	8	4	4	5	3
Marriage/kids, family transition	9	3	6	4	5
New/lost job, career transition	4	2	2	4	-
Home owner, debt transition	6	2	4	4	2
Endowment, asset transition	3	3	-	1	2
Witness others hardship	3	-	3	1	2
Religious influence	1	-	1	1	-

changed, the vast majority in both groups indicated their saving approach had changed. The most noteworthy change cited by the high saving group was taking less risk and being more conservative (6). For the low saving group, a change to save more (8) was the most frequent response. The events that were cited by both groups as causing a change in their saving approach were generally the same. Two exceptions were that the high saving group alone cited running a business as influential (2) and the low saving group alone cited an employment transition as influential (4).

In addition to the high and low saving comparisons, group saving differences were explored between men and women. Differences between the sexes in saving have received less attention from researchers (Sunden & Surette, 1999), but there were some interesting differences observed in these interviews. Men were more likely to say they deliberately planned savings (11) in contrast to women who were more likely to decide as things come up (4) or both (4). A 2 (male, female) x 3 (plan, no plan, both), Pearson chi-square test was performed. A significant difference was apparent in planning savings between men and women (χ^2 (2) = 8.26, p = .016). Three 2 x 2 Pearson chi-square test were conducted on attributional preferences (internal / external; stable / unstable; and controllable / uncontrollable) for males and females. Only one result was significant. Males and females differed significantly in categorizing saving as internal/external (χ^2 (2) = 6.171, p = .046). Men tended to emphasize internal and women tended to emphasize external or both. In the words of one male respondent:

> I don't think it's external factors, I think it's primarily internal. The basis for my reason there is that I've seen high-income people who don't save or invest in very good assets. Then, I've seen people with very modest income retain a very large

portion of their income. I think that's purely internal. (respondent 20, male, high saving)

A female respondent who felt it was both internal and external felt differently; "I think it certainly depends on such things as income and unforeseen expenses" (respondent 8, female, low saving). Another woman who said both responded: "I think the thing, for me, that really has affected it was being divorced which would be more external in nature" (respondent 14, female, high saving).

Overall, the high and low saving groups were similar across most measures. Both groups tended to cite similar influences and reasons for saving. Some observed differences in this small sample were that the high saving group was: older, had more children, spent less than income, preferred less risk / more conservative, felt financially lucky, deliberately planned savings and personally conducted investment research. Men and women in the sample also differed in deliberately planning savings and using person attributions for others' saving.

Saving process description.

The interviews conducted in Study 1 cited many heuristics for short-term, spending control supporting mental accounting (Shefrin & Thaler, 1988). In the first open-ended question, "What do you think of when I say saving?", most participants associated saving with an action such as putting money away (12), controlling spending (5) or planning and allocating resources (2). For example, "I think of putting money away outside of use for say the next six months" (respondent 4, female, high saving) or "Conserving" (respondent 5, male, high saving). The second most predominant type of association for saving was a tangible outcome (retirement) or means to saving

(bank/money) (7); "I think it's really retirement as far as saving goes" (respondent 7, male, low saving). Least associated with saving were intangible outcomes such as security or unforeseen events; "I think security. I think future. I think rainy days. I think making sure there's something to fall back on." (respondent 8, female, low saving).

For 17 participants, there was also a clear-cut difference between saving and investing. For example, "Saving could be literally sticking money under your mattress, but that's not investing. Investing to me means buying something" (respondent 1, male, low saving). According to participants who perceived a difference, investments had higher returns, higher risks and longer time-horizons. In contrast, savings were described as low return, low risk and short-term. Savings were also described as a basis or tool for investments, "Savings give you the ability to invest. Investing is where you try to generate as much capital as possible" (respondent 3, male, high saving). The remaining 7 participants tended to view saving and investing as interrelated, "Yes it is the same. I would say that investing is a subset of saving, it is a kind of saving" (respondent 9, female, low saving). Overall, the observed tendency among most participants was to separate the processes and assets associated with saving and investing into different categories with different characteristics.

Pervasive use of heuristics and mental accounting (Thaler, 1992) were apparent in responses to the question, "Can you describe any strategies to put aside money for your saving goals?" Over half of participants (13) reported using a personal, informal heuristic and 12 also reported the need for self-control/spending discipline to save. For example,

> I think the easiest way to do it is, you sit down at the beginning of the month or when you get paid, and put things into separate accounts. I have a lot of bank

accounts. One of them is for my recurring expenses... I run my own little escrow account. Every year in June, I look through all the cancelled checks and figure out how much I spend and how much am I putting in there. (respondent 2, male, high saving)

As seen in Table 12, other mental accounting heuristics were widely used. These included: using automatic deduction (8), tax shelters such as 401k, 403b, IRA and SEP (8), creating separate accounts (6), making money inaccessible (6), adjusting savings to current income (3) and saving windfalls (2). Heuristics were cited consistently by almost everyone interviewed. Mental accounting heuristics were used across participants ranging in age from 23 to 77. This is a stark contrast to generational or age-cohort accounts of saving (e.g., Department of Labor, 2002) which portray saving as dependent upon common experiences and attitudes different generations share. Both men and women used heuristics. While many studies have observed gender differences in saving and financial decision-making (e.g., Sunden & Surette, 1999), both sexes seem to share mental accounting. Finally, people with high and low saving used heuristics equally.

Participants voiced a central tenet of the Shefrin and Thaler's (1988) behavioral life cycle hypothesis, saving requires effort and self-control strategies that decreased effort were more successful:

There are a couple of no-brainer items we do automatically. We don't even see the money – it's gone from either our bank accounts or our paycheck. We both max out our 401ks at work (respondent 4, female, high saving)

I think if you have it taken out of your bank account or paycheck automatically... That's a great way to do it. ... [it takes] the inertia out of the equation. If it happens automatically, you have to take a pretty big step to make it stop (respondent 1, male, low saving)

Basically, my strategy is not to see the money...because making the decision to do it every week ... you're less likely to do it (respondent 9, female, low saving)

You don't see it in your paycheck at all, it's not even considered (respondent 11, male, low saving)

I just try to stick [money] away in a different account. Kind of pretend it's not there and don't give myself a chance to spend it. (respondent 22, male, low saving)

There is also deciding that certain parts of your income are not parts of your income in a sense. (respondent 7, male, low saving)

It is worth noting that adopting the 401k, 403b, IRA or SEP pre-tax contribution maximum was a heuristic for setting contribution levels as opposed to personally estimating amounts to save for retirement. As Thaler (1994) observes, tax-sheltered annuities such as a 401k or 403b are good mental accounting heuristics: a) the money is perceived as off limits for spending/penalized for spending, b) saving is immediately

rewarded, c) they are simple to use and understand, and d) it is considered a smart thing to do / good deal by experts. People tend to follow the path of least cognitive effort. For example, Choi et al. (2001) tested the before and after levels of saving in 401k plans at three companies with 80,000 employees where the 401k went from a choice to automatic participation by default. The findings indicated:

> Automatic enrollment drastically changes 401k savings behavior. Most employees passively accept the automatic enrollment defaults, including the default savings rate and default fund. (Choi et al., 2001, p 28)

Another heuristic many participants used for establishing a saving guideline was to estimate the future cost of a good and divide saving into a set of equal monthly installments.

> If you have an annual budget for your personal needs, you have things in that personal budget that happen once or twice a year ... What I've found to be very effective is circle those things in your budget like that and open a savings account and draw from your checking account into your savings account the sum of those items. (respondent 20, male, high saving)

This is noteworthy. It is an example where saving was not the unintentional by-product of achieving an income exceeding expenses. Saving here was intentionally under-spending to achieve a goal. For example, when asked what influenced her to save, one respondent replied:

> I think goals too. When I was in school, in college, I knew you had to save and pay off loans and things like that. I really, really wanted to go to a school that cost a lot of money! [laughs]. So I think that can be an important part of saving

too – if you want something a lot (respondent 24, female, high saving)

Having near-term saving goals and self-control not to spend were prevalent in descriptions of saving. Frequencies reported in Table 11 indicated that the leading reasons cited for saving were: desire / priority / mindset (9), long-time horizon (9) and self-control / delay gratification (4). The leading reasons cited for not saving were short-time horizon (11) and a lack of self-control/impulsivity (9). Rationally establishing a long-term spending level seemed to be a foreign thought process among these participants. For example, six participants mentioned using an annual budget to monitor spending. No one mentioned establishing a 5, 10 or 20-year budget with set spending levels or a proportional growth constant. Saving, as described in these interviews, was similarly not a synthesis of assets. People did not remove asset labels and pool things together to set a spending limit. Saving was described analytically. People gave assets labels and separated them into different categories again supporting a short-term, mental-accounting heuristic approach.

The strategies used to put money aside were largely informal and unique to the individual. Only one participant (respondent 15, male, high saving) mentioned attending formal seminars on saving and investing. Many participants said their saving strategies were self-taught or garnered from observation, trial and error, and incidental learning:

> You know, I might sound like I've got this all organized, but it's just in my head. (respondent 1, male, high saving)

> [saving strategies] surely did not come from a formal education for me. (respondent 14, female, high saving)

I haven't really had any training on saving. (respondent 22, male, low saving)

People did not discuss their financial future in terms of certainties nor probabilities. In fact, many people remarked at feeling very uninformed:

I don't pay enough attention to financial reports on the television or anything like that to affect what I am doing. (respondent 8, female, low saving)

I am not very well informed...Really, my lack of very good information leads me to believe that I need to diversify (respondent 7, male, low saving)

No one described a rational process for estimating the value of current and future assets to set an optimal spending level as proposed by the life cycle theory (Modigliani & Brumberg, 1954).

A strong tendency among participants answering the question "how has your saving approach changed" was to report becoming increasingly more conservative/ preferring less risk (8) and saving more (8) over time. There also were changes in saving approaches that occurred with asset acquisition like home ownership:

...buying the house and having something to lose. The house gave us a sense of permanence which means you have to make all kinds of longer-term plans (respondent 9, female, low saving)

For those with assets, the preference for lower risk and loss aversion directly followed Kahneman and Tversky's (1979) value function. Because "losses loom larger than gains"

(Kahneman & Tversky, 1979, p. 279), the value function for losses is steeper than for gains which leads to risk aversion. As Shefrin and Thaler (1988) observe, the elderly do not dissave their assets to a permanent income level and are reticent to spend housing equity. Participants' saving descriptions mirrored the prospect theory value function in many respects.

People did refer to changes brought about by their stage of life. When asked if he foresaw any future financial obligations, a 77 year-old respondent replied "really at my age nothing major ... If I were younger, I probably wouldn't give you the same answer" (respondent 6, male, high saving). Similarly, a 26 year old respondent said the way her saving approach had changed was that "the security means a great deal – which I would never have understood or appreciated at a younger age" (respondent 17, female, low saving). Another respondent notes "the stages of life you go through ... warrant changes in your [saving] styles. Your needs are different as you go through life" (respondent 16, female, high saving). However, these life cycle changes were often unanticipated and primarily reflected the household's current situation. Shefrin and Thaler (1988) propose that savings depended on current income and that people do not smooth their spending over time. Kahneman and Tversky (1979, 1984) also portray decisions made under risk and uncertainty as weighing gain or loss from a reference point with a bias toward the status quo (Tversky & Kahneman, 1991). For most participants', the saving decision reference point appeared to be the current situation as opposed to a life cycle assessment of past, present and future. Nineteen of the twenty-four participants indicated their saving approach had changed over time. For example, "[our saving approach] had to be flexible ... to accommodate whatever our incomes are at a certain time" (respondent 13, female,

low saving) and "I'm not sure that anything exactly influenced [my saving approach] other than as situations changed" (respondent 12, male, low saving). Overall, the self-depictions of saving among these participants consistently portray the process for making saving decisions as relatively short-term and heuristic.

Finally, life cycle theories propose that a primary constraint on people's borrowing is external (Thaler, 1992). That is to say, people will borrow until financial institutions refuse to lend and impose a liquidity constraint. However, a number of participants indicated strong debt aversion and self-imposed borrowing constraints:

> I'm too cheap to pay interest on a lot of things, so I save for cars. Paying interest if you don't have to is stupid. (respondent 3, male, high saving)

> ...while I was in college I spent all the money and went into debt $15,000 on credit cards. ... I don't know what that was all about, but fortunately ... I ended up being able to pay it down to zero before I got out of college. I don't like owing people money now - even if it's a matter of someone lending me $20. I don't like having that over my head. (respondent 20, male, high saving)

> Halfway through junior year of college, I started getting into huge debt for school...Boy, that was the dumbest thing of all time. It's taken me about 10 years to get rid of it ...Now that I have something, I'm doing everything I can to save and not go back into that debt that I was in. (respondent 10, male, low saving)

Lack of borrowing was not at the sole discretion of financial institutions. Some participants conveyed a strong personal experience that led to their debt aversion again underscoring the importance of mental accounting and psychological factors.

Additional saving factors.

The frequencies of experiences, circumstances, personality and risk on saving are reported in Table 13. Many factors not traditionally associated with life cycle or mental accounting saving theories were cited as influential. The most notable factors were social experiences and ethics/morals. Two other processes that may be relevant to saving, adult development and attributional processes, were evident in participants' answers, but are largely unaccounted for in the saving literature (Browning & Lusardi, 1996; Warneryd, 1999).

Every participant was able to share an aspect of their circumstances, experience or personality that influenced their ability to save. The overwhelming majority of responses indicated an influential experience (17). Personality (4) and circumstances (3) were mentioned less often. The experiences recalled were often vivid, powerful and compelling. For example:

> My dad had a massive heart attack back in 1946. At that time, there were no insurance policies for average working people and that, for all practical purposes bankrupt them ...I can still remember as a youth, although many years had gone by, still making payments to [hospital]. So I think that had an influence on my life. Always having in the back of my mind deep down somewhat of a fear of poverty. I never wanted to be in that situation. (respondent 3, male, high saving)

Growing up during the Depression you learn some pretty good lessons as far as savings go. (respondent 6, male, high saving)

When I had [my daughter] being on disability and going back to work part-time made us really reevaluate our financial situation. (respondent 23, female, low saving)

Terrorism! Living in New York City! We had a safety deposit box in the World Trade Center! ...There's this whole plan in the event of a catastrophic thing. You've got to save in a different way almost. So you can get at money when everything else is not available in different locations ... Now we buy gold bars... (respondent 24, female, high saving)

I do see my parents right now and know that perhaps they did have an opportunity or two back 30 or 40 years ago that would make their lives a lot more comfortable right now. They didn't do that and then really bad things happened ...their country evaporated! [civil war forced parents to flee country for U.S.] That really does influence me to think how do you really make things secure long-term? (respondent 7, male, low saving)

Growing up in a large family on a fireman's salary you certainly learn what you need and don't need (respondent 9, female, low saving)

The most cited experiences were upbringing (14), poverty/debt/bankruptcy (9) and working/saving early in life (5). A few participants noted that hardship did not have to be experienced personally. Participants reported significant influence from a financial/medical hardship that was witnessed among friends or relatives.

> You know, a lot of people will live life to the hilt and forget about the future. I had a friend die when he was 38 years old. He had no life insurance whatsoever and he had 2 kids. I think that was improper. (respondent 2, male, high saving)

These experiences often led to a strong emotional tie to saving. For example:

> My dad started a business ... and my parents pretty much took all their money and put it in there. When that did not work and we came back – we didn't have anything. ... It was hard. I just remember for years, and even now, just them – getting them back on their feet and what they went through...So I think that had a large impression on me. These were people who worked really, really hard, you know. It's not like they were lazy. ... I didn't want to be in that situation. (respondent 24, female, high saving)

However, the impact of these experiences on saving was not straightforward. It might be tempting to say poverty, loss of employment or a health problem has a unilateral negative effect on saving. As seen here, some participants reported the exact opposite. A negative experience made them an extraordinary saver highly motivated to prevent a financial hardship from happening again. For example, another participant notes:

> Saving is very important to us right now because we've burned through a lot of it and we know how important it can be to have it. (respondent 9, female, low saving)

Similarly, one's upbringing could model excellent saving or engrain very poor saving as exemplified in the following excerpts:

> I think my parents have been a big influence. As far as saving goes that would be a negative influence! My family is very impulsive and my dad always had a very stable and very good job ... we generally got what we wanted. (respondent 17, female, low saving)

> "...my dad was a millionaire ... he brought me into his thoughts on financial planning and financial management at a very young age...I managed my own investments portfolio when I was about 10 years old...So I think that I learned a lot from him" (respondent 20, male, high saving)

There were participants who were known through their relationship with the researcher to have undergone very similar experiences (e.g., recent job loss). However, some people did not mention these experiences at all during the interview. This may be due to differing levels of comfort in disclosure or knowing the researcher. However, it does not appear that a particular experience is equally salient nor does it influence everyone's saving in the same direction. Saving outcomes appear to depend strongly upon the individual's response to the experience. In terms of other saving influences, many participants again cited a conservative personality (9). Transitions in marriage / parenthood (2), employment (2) and income (2) were also influential circumstances.

Not mentioned in either the life cycle (Modigliani & Brumberg, 1954) or mental accounting (Shefrin & Thaler, 1988) approaches to saving, is a moral or ethical

component to saving. Surprisingly, participants expressed a strong moral or ethical imperative to save. Twenty out of twenty-four said they felt a moral or ethical obligation to save. The primary reasons cited were: duty as a family provider (12), not to be dependent/burden on others/society (7), religious obligation to share/steward what you have (4) and that waste/excess is wrong (3). Most striking and surprising was the moral obligation people expressed to provide for themselves and not be dependent upon others:

> I think the moral obligation to me is that you take care of yourself. You can't expect people to take care of you. In other words, you save for your life, or retirement or whatever, and it's so you aren't a burden on other people whether through the social system or your own family. (respondent 19, male, high saving)

> I feel that you should be able to cake care of yourself in a manner that you're not a burden on society or others. (respondent 4, female, high saving)

> I don't want to be dependent upon other people. (respondent 11, male, low saving)

> ...the last thing you want to do is run out of resources ...I think it would be horrible to ask other people to support you. (respondent 5, male, high saving)

It is worth noting that the desire to not be dependent was phrased differently than Keynes (1936) independence motive for saving, "the power to do things", or life cycle motive to "provide for future needs". For example, the assertion "I don't want to be a burden on society" (respondent 8, female, low saving) has a different connotation than "earned income for me will end presumably, so I'll need money to do things" (respondent 1, male, low saving). Independence conjures positive images of self-reliance, power to choose and capability. Achieving independence is an esteemed social ideal. In sharp

contrast, dependence carries the stigma of needing assistance, having limited choice and being incapable. Furthermore, some factors thought to be highly influential, were rarely mentioned. For example, Keynes' (1936) bequest motive that is often cited in the economic saving literature as a highly influential reason for saving was directly mentioned by only one participant.

Religious reasons were also cited. Three women cited a religious reason like:

> I do have a spiritual side that says I have to be a good servant with whatever I've been given. (respondent 14, female, high saving)

> My reasons follow more the Biblical line ... I definitely believe that God wants us to be good stewards of what He gives us" (respondent 21, female, low saving)

Conversely, it was predominantly males who cited a duty as family provider such as, "I guess when you get married, I think that I do perceive that I have an obligation to ensure my family's financial security" (respondent 20, male, high saving). Among the 4 respondents who did not express a moral obligation, some reasons were: "It's more likely to be self-preservation than ethics" (respondent 7, male, low saving) and "I don't feel bad about any type of thing I do financially. Not from a moral sense at least. To me it's all numbers" (respondent 10, male, low saving).

Many participants cited the influence of marriage, employment, children, home-ownership, elder care and other demographic changes on saving. However, there were often more profound reasons for saving changes beyond simply entering a demographic life-stage. A recurring sub-text for saving was also maturation / adult-development and

learning that accompanied or paralleled each life-stage. For example, two participants making the transition to being new parents observe:

> I'd say having kids also spurred on the need to have emergency funds. It's not just [my husband] and I if we screw up. (respondent 9, female, low saving)

> I guess we save for different things. Where before it might have been for something for the house or something for [my husband] and now it's more for [our daughter]. So I guess in that aspect, it's changed our perspective and what we save for and what we don't. (respondent 23, female, low saving)

Two recent college graduates making their transition into the workforce note:

> ...when you're finally on your own and no longer under the umbrella of your family and you have to earn for yourself – you realize that you have to have a safety net (respondent 17, female, low saving)

> I've come to respect how hard money is to earn! ... Living out on my own, I realize how hard it is to keep the money and to budget...In realizing how hard it is to earn, I've made a larger effort to put certain money aside every week. (respondent 22, male, low saving)

Other respondents phrased saving more directly in maturational terms:

> Once you reach adulthood you achieve a certain maturity... and are probably saving for the same reasons ... a responsible, mature person saves whereas the

opposite would be true of an irresponsible person.

(respondent 17, female, low saving)

...it revolves around what I consider an adult lifestyle

(respondent 3, male, high saving)

In Warneryd's (1999) psychological schema for saving behavior, he describes a necessary precedent for saving as a prompt to action. The person recognizes future needs and possibly inadequate future resources. However, this recognition "does not always or for every person trigger a *prompt to action.* Here the willpower or self-control or some other volitional concept comes in." (Warneryd, 1999, p. 324). As participants described these transitions, the change in their saving approach followed a personal realization about the situation. Many of the realizations and subsequent saving changes were similar. For example, new parents felt an increased responsibility for their child's future. Again, this is reminiscent of development theories that demarcate growth stages by attaining certain skills, abilities or views. Simply shifting to a new demographic category or age group does not necessarily change one's saving.

There was also an attributional interpretation of participants' saving descriptions (Weiner, 1985). Three follow-up probes to the question "What do you think of when I say saving" asked participants whether they felt saving is primarily internal/external, stable/unstable and controllable/uncontrollable for an individual. The predominant theme was a personal attribution that saving was due to an internal (16), stable (16) and controllable (19) trait. Another theme was that a person attribution (Trope, 1986) seemed

more prevalent in explaining others' success at saving. Interestingly, when asked "why do some people save while others do not save", participants tended to answer why people do not save. Twenty-three respondents offered reasons why people do not save as opposed to 18 respondents who gave reasons why people do save. Saving is the result of desire/priority/mindset (9), upbringing (8), self-control /delay of gratification (4) and conservative personality (4). The reasons cited for why others fail to save retained a trait flavor; no control impulsive (9), lack mental/planning ability (4). However, the reasons for not saving cited more situational factors: cannot afford/low income (5), lack education (5) and medical/financial hardship (4). Participants were willing to attribute saving success to desire (9) and upbringing (8), but apparently reluctant to equally attribute saving failure to lack of desire (2) and poor upbringing (3).

Social factors were a final source of influence both at a micro/personal and macro/societal level. As noted earlier, most participants' approach to saving was self-taught and often self-motivated. For example, when asked what sources of information were used to make saving and investment decisions, participants preferred to conduct their own research (13), confer with friends or relatives (10), read magazines/newspapers (8) and get material from work or personal contacts (5) versus seeking professional help from lawyers, accountants, brokers, bankers, seminars or financial planners. While influences to save tended to be personal and one-to-one, influences to spend were often portrayed as societal.

> The typical, average American is too far in debt, and the American way is to spend and go into debt. (respondent 20, male, high saving)

> A lot of what society says is an "enjoy it while you have it" kind of philosophy. Do it now. Live life to the fullest and that kind of philosophy. And people do that. You know, they run up their credit cards and all those kind of things. They overspend and do all those things except saving. The materialism of our world … (respondent 21, female, low saving)

> I think the biggest thing is to get away from buying things because you want them versus because you need them. It's all the fault of Madison Avenue. Just because somebody says it's right, doesn't make it right. (respondent 3, male, high saving)

The participants observed that while many social forces promoted and rewarded spending, there were not comparable efforts for saving. To expand on these qualitative findings, Study 2 provided quantitative results on a larger, nationally representative sample using the 2001 Survey of Consumer Finances (SCF).

Discussion

The saving interviews in this study were informative both in what was said, and in what was noticeably absent (e.g., bequest motive). The purpose of this study was to explore and describe individuals' experience of saving in detail with respect to three primary questions:

1) Do self-depictions of saving differ between households who save more versus less than expected for their age and income? [*group differences*]
2) Do people describe their saving process as long-term and rational or short-term and heuristic? [*saving process description*]

3) Is saving influenced by factors not explicit in either life cycle (Modigliani & Brumberg, 1954) or mental accounting theories (Shefrin & Thaler, 1988)? [*additional saving factors*]

A number of key themes emerged to answer these questions using Richie and Spencer's (1994) qualitative framework analysis coding techniques.

First, self-depictions of saving exhibited subtle differences between households with high and low savings for their age and income using Stanley and Danko's (1996) wealth scaling approach. While both groups tended to cite similar influences and reasons for saving, some differences in this small sample were observed. The high saving group was: older, had more children, spent less than income, preferred less risk, were more conservative, felt financially lucky, deliberately planned savings and personally conducted investment research. Men and women in the sample also differed in deliberately planning savings and using person attributions for others' saving.

Second, strong support was evident for short-term, heuristic saving tied to current income. There were few people who claimed to have a life-span time horizon or perform complicated calculations for saving. The saving process description tended to follow the mental accounting model of Shefrin and Thaler (1988).

Third, people reported influences outside the life cycle (Modigliani & Brumberg, 1954) and mental accounting models of saving (Shefrin & Thaler, 1988). Emotion, personality and motivation were cited as important influences upon saving. There was also a strong ethical or moral rationale underlying saving. For some saving was socially responsible. Saving prevented one from being a burden on others. For some saving was spiritually responsible. It was important to be a good steward of what one has been given

and not waste it. For others saving was environmentally responsible. Conserving a natural resource ultimately meant saving money. Many respondents also spoke of not saving when young, and starting to save after learning saving was important or gaining assets / family responsibilities that prompted saving. Respondents who saved earlier often explained that someone had shown them saving was important earlier or had a pivotal early work experience:

> ...when I was a kid, I had my first business when I was 7 years old. I raised strawberries. I learned that if I wanted money in the world, I had to work for it and it was pretty dear! So, for things I wanted as a child, I would save that money until I bought it. ...Consequently, we learned a work ethic more than anything else. To get anywhere you had to earn it. (respondent 19, male, high saving)

Cohort, generational or life cycle effects, therefore, were potentially interpretable as differing stages of financial maturity. Thus, an under-appreciated source of saving variation is adult-development. Regardless of demographics, the financial maturity that occurs for one person at seventeen years old might not occur for another until they are seventy. Participants also demonstrated attributional processes in separating causes for saving for oneself and others into personal/trait attributions (internal, stable, controllable) versus situational/state attributions (external, unstable, uncontrollable) (Weiner, 1985; Trope, 1986).

Finally, social influences such as peers, society, one's upbringing and experiencing or witnessing a financial catastrophe were cited. Social factors that influenced one to save tended to be vivid personal experiences. Social factors that influenced one to spend were described as societal and pervasive. In sum, participants

alluded to many additional factors and processes outside of those described in the life cycle and mental accounting theories of saving they felt were influential. The study was limited in that the qualification as high or low saving was made by the researcher. Future qualitative research may pre-qualify participants more objectively regarding the level of their savings and use an in person interview approach instead of telephone.

CHAPTER III

STUDY 2

The second study tested how well variables from mental-accounting psychology and life-cycle economics predicted relative saving levels (high versus low). The variables were derived from the economic life-cycle (Modigliani & Brumberg, 1954) and the psychological mental accounting (Shefrin & Thaler, 1988) theories.

Beyond theories, there are pragmatic concerns in correctly classifying individuals' saving and wealth. Kennickell (1999) described a problem in using income data to predict wealth for the Survey of Consumer Finances (SCF). The SCF used a list sample from income tax returns to stratify and select wealthy participants with a wealth index. The original wealth index (WINDEX0) used for the 1998 SCF was a model that scanned income data for signals of wealth such as interest, dividend, rent/royalty or business incomes and home equity. After discovering that WINDEX0 misclassified many wealthy Americans on the Forbes 400 list, however, research was conducted to improve the wealth index. A second wealth index (WINDEX1) was constructed to include age, geographic location and other financial indices and the model produced an adjusted R square of 0.72. Such life-cycle demographic indices did separate the wealthy from the non-wealthy, but have difficulty discerning net worth differences within categories. For example, when the net worth and income ranks generated by WINDEX1 were applied to the Forbes 400, the Spearman rank correlation is 0.35. Kennickell (1999) concluded, "Ultimately the functional relationship between income and wealth is difficult to

estimate: typically, a log-linear regression of wealth on income, age and many other factors that are typically expected to explain the heterogeneity of wealth holdings will have an R square of only about 0.70." (p.8).

Taking cues from this and other saving studies (Bae, Hanna & Lindamood, 1997; Bernheim, Skinner & Weinberg, 1997; Chaulk, Johnson & Bulcroft, 2003; Chen, Hanna & Montalto, 1998; Hilgert, Hogarth & Beverly, 2003; Kennickell, 1995, 1999), this study analyzed nationwide survey data for differences between individuals with high and low savings. While Study 1 used detailed qualitative data to compare individuals with high and low savings; this study was a quantitative secondary analysis of personal interviews from a representative sample of 4,432 American households collected in the 2001 Survey of Consumer Finances (SCF). The primary research question was what variables separated people whose savings were high or low for their age and income? The following sections list hypotheses for the present study.

Life Cycle Hypothesis

The first hypothesis was that seven life cycle variables (age, income, children, consumption shocks, bequest motive, precautionary motive and future expectations) would predict high saving versus low saving. As described in the literature review, this hypothesis was derived mostly from Modigliani's (1985) simple aggregate consumption function:

$$C = \alpha YL + \delta W$$

C = Consumption during a short-term period

α, δ = Demographic parameters of length of life (age), retirement

YL = Income

W = Wealth

In the life-cycle hypothesis, individuals rationally estimated future wealth to optimize spending. If income exceeded the long-term level of life resources (Modigliani & Brumberg, 1954) or permanent income (Friedman, 1957), saving occurred. Bequest and precautionary motives, optimistic future expectations, entering middle age and having a high income were expected to be associated with higher saving. It was also expected that having children and consumption shocks would decrease saving.

Mental Accounting Hypothesis

The second hypothesis was that seven mental accounting variables (regular saving, number of asset accounts, current asset / income ratio, future asset / income ratio, home ownership, estimated savings needs and credit use) would predict high saving versus low saving. This hypothesis was derived predominantly from Shefrin and Thaler's (1988) description of saving:

$$C = f(I, A, F) \text{ and}$$

$$1 \sim \delta C/\delta I > \delta C/\delta A > \delta C/DF \sim 0$$

C = Consumption during a short term period

I = Current income account

A = Current asset accounts

F = Future asset accounts

Spending was a function of current income, current assets and future assets defined by an inequality where income was most likely to be spent, current assets less likely and future assets least likely. It was expected that a regular saving plan, a higher number of asset accounts, higher future and current asset to income ratios along with estimated saving

needs would be associated with high saving. Home ownership and not using credit should also separate high versus low saving groups.

Life Cycle vs. Mental Accounting Hypothesis.

It was hypothesized that two separate models (life cycle and mental accounting) with a similar number of predictors would differ significantly in their ability to predict high saving versus low saving. It was expected that both life cycle and mental accounting variables would provide significant factors for predicting high saving versus low saving. It was also expected that a life cycle model would have larger effects than a mental accounting model.

Life Cycle with Mental Accounting Hypothesis.

It was hypothesized that a model that combined life cycle and mental accounting factors (14 variables) would improve the prediction of high and low savings beyond the level of either model alone. It was expected that the life cycle variables would have the largest effects and precede the entry of mental accounting factors in stepwise models. It was also expected that mental accounting factors would have significant effects that would improve the model.

Method

Sample Selection. This study used secondary data from the 2001 United States' Federal Reserve Board's Survey of Consumer Finance (SCF). To select participants, the SCF used multi-stage sampling with an area probability sample for the general population of the United States and a list sample derived from tax records for wealthy respondents. This methodology has provided a representative American sample especially among wealthy respondents. In the 2001 SCF, there were 4,442 completed interviews. Of these,

2,917 families came from the area probability sample and 1,532 came from the list sample. The response rate for the area probability sample was 68% and 30% for the list sample. For the wealthiest families on the list sample, the response rate was 10% (Bledsoe, 2003).

Participants. There were 4,442 heads of households (78% male, 22% female) who elected to participate in the 2001 SCF. Participation was voluntary and not compensated. Ages ranged from 18 to 95 (M = 50.22, SD = 16.12). Incomes ranged from $0 to $111 million ($M$ = $67,998, SE = $1,800, Mdn = $39,928) and participants' total net worth ranged from -$116,000 to $586 million ($M$ = $395,000, SE = $10,500, Mdn = $86,100) (Aizcorbe, Kennickell & Moore, 2003). The sample contained White (81%), Black (10%), Hispanic (6%) and Asian/American Indian/Pacific Islander (3%) respondents. Married respondents predominated (61%), followed by divorced (13%), never married (12%), widowed (7%), living with partner (6%) and separated (1%). Over half the 2001 SCF sample (56%) had no children while 44% had one or more children (M = 0.9, SD = 1.18, Mdn = 0).

Materials. The Survey of Consumer Finances is detailed in three downloadable files. The files downloaded were the Survey of Consumer Finances 2001 codebook (2003, June 8), the Map of Variables (2003, June 8), and a copy of the computer-assisted personal interviewing (CAPI) program or CAPI file (2003, September 8). For Study 2, all question wording and responses referred to the SCF 2001 codebook (2003, June 8).

The triennial SCF has been conducted since 1963 by the United States Federal Reserve Board to assess American finances conducted in 2001 by the University of Chicago's NORC. The SCF is a 90-minute, in-person interview that contains over 500

separate items. Extensive questions probe current financial assets (including inheritance and family transfers) and non-financial assets (housing, other properties, businesses, vehicles). The SCF examines liabilities in depth (education, mortgage, credit cards) as well as attitudes (financial institutions, credit, saving). Respondents' employment history (job status, type work, title, hours, salary, benefit plans) and income is thoroughly examined both for respondents and their spouses / family members. Finally, demographics are collected as point and range estimates (age, income) and categorical variables (sex, race). Table 15 describes the overall structure of the SCF.

Variable Selection. This section outlines the rationale for selecting the life cycle and mental accounting variables used in this study. As seen in Table 1, economic and psychological saving theories presented divergent pictures of who should and should not be proficient at saving. The present study used variables extrapolated from the life cycle (Modigliani & Brumberg, 1954) and mental accounting (Shefrin & Thaler, 1988) theories and gauged how well these variables separated those with relatively high versus low saving. Therefore, variables for this study were organized as roughly falling underneath the headings of life cycle, or mental accounting.

Life-Cycle Variables. There were seven primary variables selected from economic life-cycle theories: income, age, children, future expectations, consumption shocks, bequest and precautionary. The type of variable, corresponding SCF questions and procedure that created each variable are specified in Table 16.

The life cycle theory described by Modigliani & Brumberg (1954) can be reduced to a smaller set of key factors and concepts. The hump shaped age / income profile associated with the life cycle hypothesis indicated most saving coincides with peak

Table 15
Study 2: Structure of the Survey of Consumer Finances (SCF)

Section	Questions	Description of Section
Introduction	8	Demographics
A	40	Financial Institutions
B	15	Credit and credit cards
D	68	Housing
E	37	Other properties
F	22	Businesses
G	40	Vehicles
H	21	Education loans
I	56	Financial assets
J	21	Savings attitudes
R	100	Employment
T	40	Income
X	12	Inheritance and interfamily transfers
Y	40	Demographics
Z	20	Interviewers Observations

Table 16
Study 2: Life Cycle Variables from the Survey of Consumer Finances (SCF)

Variable	Type	Description	Source
Age	Continuous	Age in years	SCF extract (age)
Income	Continuous	Income in dollars	SCF extract (income)
Kids	Categorical	Number of children	SCF extract (kids)
Shock[1]	Continuous	Number of spending shocks	SCF (see note)
Bequest[2]	Continuous	Bequest importance (5 pt)	SCF (x5824)
Precautionary	Categorical	Precautionary saving (0,1)	SCF extract (hsavrs7)
Expectations[3]	Catego rical	Future expectations (4 pt)	SCF (see note)

[1] SHOCK = sum of dummy code 1=present, 0=absent for: x7372 (divorced, separated, widowed), x4100 (laid off, unemployed, disabled), x6772 (bankrupt), x6030 (respondent is in poor health), x6124 (spouse is in poor health) or x7397 (have no public or private health insurance), e.g., for a divorced, unemployed, disabled respondent, SHOCK =3.

[2] BEQUEST = recoded 1=Very important, 5=Not at all important to 1=Not at all important, 5=Very important

[3] EXPECTATIONS = sum of dummy code 1=expect better, 0=expect worse: x301 (future economy) + x302 (future interest rate) + x3023 (future retirement) + x7364 (future income level).

earnings (*income*) during middle age (*age).* A larger number of children *(children)* were also assumed to decrease saving (Modigliani & Brumberg, 1954). As seen in the literature review, the life cycle hypothesis and the Euler equation in use today focused upon dynamic factors that changed over time along with the subjective expectations surrounding these changes and how they would affect spending (e.g., income / expected income, age / expected lifespan, children / expected family size). Many demographic factors like sex and race remain constant over time; therefore, they were not included. To set a spending level, the individual rationally optimized the dynamic factors. Spending was then adjusted according to expectations about future income, interest rates and the economy *(future expectations).* Contemporary research has also explored the effects of consumption shocks *(consumption shocks)* and motives to leave a bequest to heirs *(bequest)* or build up a precautionary buffer stock for emergencies *(precautionary)* (Browning & Lusardi, 1996). Again, in oversimplified terms, consumption shocks decreased saving and bequest / precautionary motives increased saving.

Mental Accounting Variables. Comparable with the life cycle variables, there were seven variables generated from mental accounting psychology: regular saving, future asset account, current asset account, number of asset accounts, house, saving estimate and credit use. The type of variable, corresponding SCF questions and procedure that created each variable are specified in Table 17.

The mental accounting theory of Shefrin and Thaler (1988) can also be condensed into a few key variables and concepts. Reducing the cognitive effort necessary to control spending is central to mental accounting (Shefrin & Thaler, 1988). As participants in Study 1 observed, pre-commitment heuristics that automated saving decisions minimized

Table 17
Study 2: Mental Accounting Variables from the Survey of Consumer Finance (SCF)

Variable	Type	Description	Source
Regular	Categorical	Save regularly (0,1)	SCF (x3020)
Accounts[1]	Continuous	Number of asset accounts	SCF (see note)
Current[2]	Continuous	Ratio current assets /income	SCF extract (see note)
Future[3]	Continuous	Ratio future assets /income	SCF extract (see note)
House	Categorical	Have house (0,1)	SCF extract (housecl)
Estimate[4]	Continuous	Ratio est. savings /income	SCF (see note)
Credit Use[5]	Categorical	Level of credit use (3 pt)	SCF extract (see note)

[1] ACCOUNTS = sum of dummy code 1=present, 0=absent for: bond (bonds), cds (certificate of deposit), check (checking account), dbplnt (defined benefit plan), mma (money market), othfin (other financial), othma (other managed assets), anypen (pension), saving (saving account), savbnd (saving bond), stocks (equities), cashli (cash value life insurance).

[2] CURRENT = LIQ (total liquid assets) / nrminc. LIQ = value of checking, savings, money market and call accounts.

[3] FUTURE = RETLIQ (total quasi-liquid assets) / nrminc. RETLIQ = value of IRAs, thrift accounts, and future pensions.

[4] ESTIMATE = x7187 (estimate of savings needed) / nrminc.

[5] CREDITUSE = sum of dummy code 1=present, 0=absent for: CCBAL (have credit card balance) + HDEBT (have any debt).

cognitive effort/self-control necessary for saving (see also Bach, 2003). Thus, it was expected that people saving a regular amount on a regular schedule automated some aspect of the decision and would exhibit higher savings than those saving irregular amounts on irregular schedules *(regular saving).*

As observed in Kahneman and Tversky (1979, 2000) and Minehart, Bowman and Rabin (1999), risky decisions were evaluated from a reference point often framed in the context of a current situation. Spending has been shown to be hypersensitive to current income, and current income often acts a reference point for spend/save decisions (Bernheim, Skinner & Weinberg, 1997; Thaler, 1999a). It was expected then, that a person's estimated saving needs for the future divided by their reference point of current income would provide an indicator to separate high and low saving *(estimated saving).* In contrast, life cycle consumption decisions are primarily made according to a rational assessment of aggregated wealth, demographics (e.g., expected lifespan) and future expectations. In the life cycle model, the rational consumer "will choose to consume at a reasonably stable rate, close to his anticipated average life consumption" and saving depends upon "the extent to which current income departs from average life resources" (Modigliani, 1985, p.299).

Also according to Shefrin and Thaler (1988), there were three primary mental accounts that each had a different marginal propensity to consume (MPC): current income (MPC=1), current assets ($0 < MPC < 1$) and future assets (MPC=0). All current income was assumed to be spent, but the temptation to spend current assets and future assets was lower or nonexistent. As observed by the participants in Study 1, the temptation to spend an asset was related to the extent it was available/visible and ready to

be spent (in cash). Liquid assets (cash, money market, etc) were ready to spend. Illiquid assets (401k, cash value life insurance, pension, etc.) required a lengthy and sometimes costly procedure to turn them into cash. As a result, an implication of mental accounting was that saving reduced to a person's success in transferring liquid current income into less liquid current and future assets. Asset liquidity, therefore, was used as a proxy for placement in the mental accounts of income, current assets and future assets. Therefore, it was expected that the proportion of future assets *(future asset account)* and current assets *(current asset account)* to an individual's reference point of current income would separate high and low saving.

Another important aspect of mental accounting is separating and labeling assets (Thaler, 1994). Separating and labeling assets in many ways resembles a practiced skill or expertise (Shanteau, 1992). For example, when physics experts and novices were asked to label and separate physics problems written on index cards by the approach that could be used to solve them, the arrangements were very different. Experts' problem piles were arranged on the basis of theoretical principles while novices' piles were arranged by the problems' surface attributes (Chi et al., 1981). Therefore, it was expected that a person who has created and funded a larger network of asset accounts would have a higher net worth than someone matched by age and income with fewer accounts *(number of asset accounts)*. Recall that for a life-cycle rational consumer, the number of accounts should not matter because assets are fungible and pooled together to set a spending level (Thaler, 1990).

The labeling of an asset similarly should not matter (Thaler, 1999). When rationally optimized, housing equity of $100,000 should be equivalent to $100,000 cash.

However, in Study 1, homes figured prominently in participants' past, present and future saving plans and were described differently than other assets. Despite being most families' single largest asset, home equity is underutilized for spending and funding retirement (Venti & Wise, 1989). An asset labeled "house" appears more likely to be considered off limits to spending. Thus, regardless of outstanding mortgage, having a house *(home)* was expected to separate high and low savings.

Finally, consumer borrowing was considered in the life cycle subject to external liquidity constraints (e.g., getting turned down for a loan by a bank). However, the mental accounting view was that people internally self-restricted and did not borrow up to their limit (i.e., display debt aversion). People's different level of credit use provided another means to separate high and low savings *(credit use)*.

Data Preparation. First, the Survey of Consumer Finances public data set SAS export (2004, March 27) and public data extract in Microsoft Excel (2004, March 27) were retrieved from the Federal Reserve Board. Each file was opened with SPSS v11.5.1 and converted into separate SPSS .sav files. To correct for nonresponse error, missing values in the SCF are estimated and imputed five times (Kennickell, 1998) yielding 5 values for every respondent in the data file or 22,210 cases. The full public data set has 5,306 variables consisting of both raw variables (denoted with a 'j') and the same variables formatted and recoded for analysis (denoted with an 'x'). The extract data set contains all 94 computed variables used in Aizcorbe, Kennickell and Moore (2003) to report the SCF results.

Second, the full public data set and extract were combined into a single file using the SPSS merge files function breaking on the unique case identifier (SCF variable yy1).

Merging the files resulted in 22,210 cases and 5,400 variables. Cases at the beginning and end of the files were checked to confirm that the combined file preserved the original values and order.

Finally, to allow better comparison of individual cases, the imputed values were removed by calculating the mean across the unique case identifier (y1) using the SPSS aggregate function. In cases where a value was missing, the mean of the five imputed values became the new value. In cases where the value was not missing, the mean simply duplicated and preserved the original value. This procedure created a combined file of 5,400 variables and 4,442 cases corresponding to the actual interviews. The means on key variables for the combined file were compared with the original files and the values matched. Values for a sample of individual cases between the three files were also checked and found to correspond. The aggregated file containing 5,400 variables and 4,442 cases was used in all subsequent analyses.

Exploratory data analysis was conducted on key variables used to calculate the saving index variable: age, income and net worth. There were 20 cases with zero income. For these cases, the values were replaced with the normal income adjusted to survey year (norminc). Seven of the cases did not have normal income either, so cases 36, 527, 1001, 1700, 1951, 2017, 2907 were removed as outliers. An additional 3 cases, 30, 3594 and 4271 were removed as outliers due to large imbalances between income and net worth. The total number of cases after removal of outliers was 4,432.

Operational Definition of Saving. In oversimplified terms, the two primary operational definitions of saving were residual income (income – expenses) at the end of the current period, and increased net worth (assets – debts) between two periods

(Warneryd, 1999). To create an income surplus in the current period, savers either increased income or decreased expenses. To increase net worth between two periods, savers either increased assets or decreased debts. These definitions differed according to variables measured, time horizon and number of measurements. Residual income occurred in one period and only one measurement of income and expenses was required. Net worth gain was intertemporal and required a before and after measurement of assets and debts. Thus, the question was which definition would best separate those with high saving levels versus low saving levels?

The operational definition of saving used in this study was a compromise. Successful saving was defined as a high net-worth for one's age and income less inheritances. The SCF was comprehensive in collecting financial data and well suited to calculating net worth. However, raw net worth values did not necessarily indicate saving proficiency. For example, two people may each have a net worth of $100,000, but this may be relatively low or high for that age and income. Stanley and Danko (1996) identified wealthy individuals by scaling expected net worth by (age x income less inheritance)/10 and subtracting actual net worth:

$$\frac{(\text{Age} * \text{Income})}{10} - \text{Actual Net Worth}$$

For example, a 50 year-old with $50,000 income would have an expected net worth of $250,000. Stanley and Danko (1996) created three net worth groups: a top quartile or two times expected net worth (prodigious accumulator of wealth), the middle 50 percent (average accumulator of wealth) and a bottom quartile or one-half expected net worth (under accumulator of wealth). An extension of this scale is detailed in the next section.

Creating a Saving Index Variable and Saving Quartiles. In their report on the 2001 SCF results, Aizcorbe, Kennickell & Moore (2003) removed outliers and weighted raw values on most financial measures. As noted in Kennickell (2001), the distribution of American wealth was highly skewed and the SCF sample mirrors this characteristic. Linear models, such as regression and ANOVA, which assume linearity, a normal distribution and homoscedasticity would be especially influenced by the skewed wealth distribution and presence of outliers. Weighting reduced the influence of the small nonrandom sample of wealthy households upon the larger random sample. However, weighting or excluding wealthy individuals could eliminate variation important to understanding saving.

Although previous research has made use of ratios and indexes to study saving (e.g., Bae, Hanna & Lindamood, 1997; Bernheim, Skinner & Weinberg, 1997), a new saving index was used in this study. Stanley and Danko's (1996) index was modified from being a difference score to a ratio. Actual net worth less inheritance was divided by expected net worth as calculated by age multiplied by normal income divided by 10:

$$\frac{\text{Actual Net Worth} - \text{Inheritance}}{(\text{Age} * \text{Normal Income})/10}$$

To create the saving index in the aggregated SPSS file, actual net worth less inheritance (SCF variables x5804 + x5809 + x5814 + x5818) was divided by expected net worth (age*nrminc)/10). Next, the saving index variable was rank ordered from highest to lowest. This converted the continuous saving index data into an ordinal ranking. The rank ordered saving index was then split into quartiles using the mean for ties. The SCF components of the saving index, life cycle variables and mental accounting variables are summarized in Table 18.

Table 18

Study 2: Survey of Consumer Finances (SCF) Variables Used in the Dependent (DV) and Independent (IV) Measures

Saving Index (DV)[1]	Life Cycle (IV)	Mental Accounting (IV)
Actual Net Worth (assets – debts)	*Age*	*Save Regularly*
CHECK (checking account value)*	AGE (respondent's age in yrs)*	x3020 (save regularly)
SAVING (saving account value)*		
MMA (money market value)*	*Income*	*Number of Accounts*
CALL (call account value)*	NRMINC (normal income)*	HBOND (have bonds)
CDS (certificate of deposit value)		HCDS (have cert of deposit)
NMMF (mutual funds value)	*Number of children*	HCHECK (have checking act)
STOCKS (equities value)	KIDS (number of children)	HDBPLNT (have DB plan)
BOND (bonds value)		HMMA (have money mkt)
IRAKH (IRA, Keogh value)*	*Consumption Shock*	HOTHFIN (have other fin.)
THRIFT (401k, 403b, etc. value)*	x7373 (divorce, separated, widow)	HOTMA (have managed asset)
FUTPEN (pension value)*	x4100 (laid off, disabled, unempl.)	HANYPEN (have pension)
SAVBND (saving bonds value)	x6772 (declared bankruptcy)	HSAVING (have saving act)
CASHLI (cash value insurance)	x6030 (poor health respondent)	HSAVBND (have saving bnd)
OTHMA (other managed assets)	x6124 (poor health spouse)	HSTOCKS (have equities)
OTHFIN (other financial assets)	x7397 (no health insurance)	HCASHLI (have cash life ins.)
VEHIC (value of vehicles)		
HOUSES (value of residence)	*Bequest Motive*	*Current (LIQ/NRMINC)*
ORESRE (other residential)	x5824 (importance of bequest)	CHECK (checking account)*
NNRESRE (nonresidential)		SAVING (saving account)*
BUS (net business assets)		MMA (money market)*
OTHNFIN (other nonfinancial)	*Precautionary Motive*	CALL (call account)*
MRTHEL (housing debt)	HSAVRS 7 (save for emergency)	NRMINC (normal income)*
RESDBT (other property debt)		
CCBAL (credit card debt)	*Future Expectations*	*Future (RETLIQ/NRMINC)*
INSTALL (installment debt)	x301 (future economy)	IRAKH (IRA, Keogh)*
ODEBT (other debt)	x302 (future interest rate)	THRIFT (401k, 403b, etc)*
	x3023 (future retirement)	FUTPEN (pension)*
	x7364 (future income level)	NRMINC (normal income)*
Inheritance		
x5804 (1st inheritance value)		*Estimate (x7187/NRMINC)*
x5809 (2nd inheritance value)		x7187 (est. savings needed)
x5814 (3rd inheritance value)		NRMINC (normal income)*
x5818 (all other inheritances value)		
		Credit use
Expected Net Worth (age x income)/10		HCCBAL (have credit bal)
AGE (respondent's age in yrs)*		HDEBT (have any debt)
NRMINC (normal income)*		
		House
		HOUSECL (have house)

Note. Independent variables and components of the dependent variable are italicized. Variables from the SCF extract data set are capitalized. Variables from the SCF data set are enumerated.

* Indicates variable used in DV and IV

[1] Saving Index = (*actual net worth – inheritance*) / *expected net worth*

Data Analysis. Descriptive statistics were calculated on each variable by saving index quartile (high saving, upper middle, lower middle, low saving). To confirm whether the life cycle and mental accounting variables were different for each quartile of the saving index, two factorial MANOVAs were run for the continuous life cycle variables and mental accounting variables by saving index quartile. Post hoc contrasts were performed to discern which levels of the saving index differed significantly from one another. Pearson chi-square tests were also run to test for differences on categorical variables by level of the saving index.

To test the hypotheses regarding the ability of life cycle and mental accounting variables to predict high and low saving, three stepwise binomial logistic regressions were then conducted on the saving index (life cycle, mental accounting, and the life cycle and mental accounting combined model). This approach fit a number of characteristics of the data (non-normal and heteroscedastic) and would fit a prediction model to a dichotomous outcome variable (high vs. low saving). Logistic regression does not assume a normal distribution for dependent variables, nor a linear relation and homoscedasticity between dependent variables. Logistic regression allows a mixture of categorical and continuous variables and applies the maximum likelihood estimation after transforming a dependent variable into a logit variable (the natural log of the odds that a case falls in one category of the dependent versus another). The logit model assesses the effect of each predictor, the significance of the predictors' collective effect on the outcome, the probability for membership in dependent groups and the correct and incorrect classification of cases into dependent groups (Tabachnick & Fidell, 1989).

Following Tabachnick and Fidell's (1989) recommendations, a balance needed to be struck between sample size (power) and variables. Parsimonious models required fewer variables:

> A general goal of regression then, might be to select the fewest IVs necessary to provide a good prediction of a DV where each IV predicts a substantial and independent segment of variability in the DV (Tabachnick & Fidell, 1989, p. 128)

Therefore, a minimal number of initial regression predictor variables (seven) were selected for the life cycle and mental accounting models based upon the literature for expected effectiveness in predicting saving. As a guide, when using a stepwise technique, Tabachnick and Fidell (1989) recommended 40 cases per independent variable. This is increased if the variables are not normally distributed and transformations are not done. At the same time, given a sample size greater than 4,000 in SCF, many tests would create significant differences with negligible effect sizes:

> For both statistical and practical reasons, then, one wants to measure the smallest number of cases that has a decent chance of revealing a significant relationship if, indeed, one is there (Tabachnick & Fidell, 129).

Therefore MANOVA tests for variable differences by saving index quartiles were conducted using the entire data set (n=4,432). However, predictive models were done with only the high and low saving groups (n=2,216). This also created the binomial outcome variable required for logistic regression.

Results

Saving Index. Exploratory data analysis on the saving index (actual net worth – inheritance / expected net worth) indicated the presence of many high net-worth outliers

that skewed the saving index distribution from normal. The saving index ratios ranged from –3.16 (3 times below expectation) to 166.47 (167 times above expectation) (M = 1.79, SD = 5.65, Mdn = 0.65). These values were rank ordered and quartiles were created from the rank order. Each saving index quartile had 1,108 members. The bottom 25 percent or low saving group's actual net worth was only 0.17 of expected net worth. Those between the 26th and 50th percentiles or the lower middle group had an actual to expected net worth ratio between 0.18 and 0.64. The upper middle group in the 51st to 74th percentile had an actual to expected net worth ratio between 0.65 and 1.73. The top 25 percent or high saving group had an actual to expected net worth ratio of 1.74 or more.

The means and standard deviations for the life cycle variables are presented in Table 19. A factorial MANOVA was performed with the saving index quartiles as the independent variables and the following life cycle measures: income, age, bequest and consumption shock. The combined dependent measures were affected by saving index level (F (21, 12,698) = 75.3, p <.001, η^2 = .106). The life cycle variable for age had the largest effect size (F = 253.2 (3, 4428), p <.001, η^2=.146), while the other effect sizes for shocks (F = 112.1 (3, 4428), p <.001, η^2=.071), income (F = 52.5 (3, 4428), p <.001, η^2=.034), and bequest (F = 27.4 (3, 4428), p <.001, η^2=.018) were much smaller. Post hoc contrasts showed that age and consumption shocks varied significantly for each saving quartile. Higher saving was generally associated with older participants, and consumption shocks were significantly more common in the low saving quartile. The high saving quartile was more optimistic about the future and valued leaving a bequest more than all three other quartiles. The income of the high saving group and upper middle groups was significantly higher than the lower middle and low saving groups.

Table 19

Study 2: Means and Standard Deviations of Life Cycle Variables on the Saving Index

Life Cycle Variable	Saving Index			
	High Saving (n=1,108)	Upper Middle (n=1,108)	Lower Middle (n=1,108)	Low Saving (n=1,108)
Age	57.51[a]	54.29[b]	47.60[c]	41.50[d]
	(14.20)	(14.76)	(14.96)	(15.76)
Bequest	3.57[a]	3.17	3.05	3.09
	(1.46)	(1.49)	(1.52)	(1.55)
Normal Income	831,295[a]	574,369[b]	189,414[c]	47,026[c]
	(2,041,733)	(2,427,731)	(849,341)	(203,538)
Shocks	.24[a]	.34[b]	.45[c]	.73[d]
	(0.49)	(0.58)	(0.66)	(0.85)

[a,b,c,d] Different superscripts indicate significant group in row $p < .001$

The categorical variables also demonstrated similar differences across the saving index. Pearson chi-square analyses were conducted for expectations, children, and precautionary saving. The future expectation variable illustrated similar distributions across quartiles with the exception that high saving people tended to rate their future expectations more optimistically than the low saving group ($\chi^2 = 39.56$ (12), $p < .001$). The distribution of children across quartiles was significantly different ($\chi^2 = 1.26$ (12), $p > .05$). Lower middle people had the highest number of children and the high saving had the fewest. In sum, these results confirmed that the saving index quartiles did differentiate people across the life cycle variables with the exception of the precautionary saving variable.

Means and standard deviations for the mental accounting variables are presented in Table 20. Factorial MANOVAs were performed with the saving index quartiles as the independent variables and the following mental accounting variables as dependent measures: asset accounts, current assets / income, future assets / income and estimated saving needs / income. Significant differences on the saving index overall were observed (F (21, 12,698) = 232.8, $p < .001$, $\eta^2 = .268$). The univariate tests also indicated significant effects for all four variables. The number of asset accounts ($F = 567.7$ (3, 4428), $p < .001$, $\eta^2 = .278$), and future assets ($F = 235.6$ (3, 4428), $p < .001$, $\eta^2 = .138$) made the largest contributions to predicting differences on the saving index variable, as measured by the partial eta squared effect size. Current assets ($F = 61.3$ (3, 4428), $p < .001$, $\eta^2 = .040$) and the saving estimate ($F = 22.3$ (3, 4428), $p < .001$, $\eta^2 = .015$) were also significant.

Table 20

Study 2: Means and Standard Deviations of Mental Accounting Variables on the Saving Index

Life Cycle Variable	Saving Index			
	High Saving (n=1,108)	Upper Middle (n=1,108)	Lower Middle (n=1,108)	Low Saving (n=1,108)
Accounts	5.09[a]	4.70[b]	3.89[c]	2.14[d]
	(1.98)	(1.92)	(1.79)	(1.60)
Current Assets	1.27[a]	.39[b]	.18[bc]	.05[c]
	(4.60)	(0.63)	(0.39)	(0.13)
Future Assets	1.64[a]	.86[b]	.31[c]	.05[d]
	(2.74)	(1.17)	(0.47)	(0.40)
Saving Estimate	.95[a]	.57[b]	.33[bc]	.27[c]
	(3.15)	(2.31)	(1.51)	(1.10)

[a,b,c,d] Different superscripts indicate significant group in row $p < .001$

Post hoc analysis of the saving index quartiles on the combined dependent variables indicated that both the number of asset accounts and the future asset to income ratio increased significantly in step with the saving index quartiles. High saving individuals (M= 5.09, SD=1.98) had almost three more accounts than low saving individuals (M= 2.14, SD=1.60). The ratio of future assets to income between the low saving (M= 0.05, SD=0.40) and high saving quartiles (M= 1.27, SD=4.60) also illustrated large differences. The upper and lower middle and low saving / lower middle quartiles had significantly lower current assets and estimated saving needs than the high saving group.

For the categorical variables, Pearson chi-square tests indicated significant differences in the use of credit (χ^2 = 452.7 (6), p <.001), home ownership (χ^2 = 1,965.6 (3), p <.001), and saving regularly (χ^2 = 177.2 (3), p <.001) across the saving index quartiles. Credit use was different for every quartile, but generally arranged in a progression of less credit with higher saving and more credit use with lower saving. The high and upper middle saving groups were significantly more likely to be home owners, than the lower middle and low saving groups. Finally, the save regularly variable illustrated a similar pattern for every quartile except the low saving group which was considerable less likely to save regularly than the other quartiles.

Life Cycle Hypothesis. Next, a stepwise binomial logistic regression of the seven life cycle variables was tested on the saving index outcome measure for just the high and low saving quartiles. The second hypothesis was that seven life cycle variables (age, income, children, consumption shocks, bequest motive, precautionary motive and future expectations) would predict high saving versus low saving.

The logistic regression results displayed in Table 21 supported the life cycle hypothesis. The model selected five variables (by order of entry: age, income, shocks, bequest, expectations) and excluded two (kids, precautionary). The model's prediction equation was Y = -4.65 + 0.074 (age) -1.26 (shock) + 0 (income) + 0.198 (bequest) + 0.155 (expectations). Holding the effect of income constant, increases in age, the rated importance of a bequest and having optimistic future expectations increased the odds ratio of being high saving. However, each additional consumption shock decreased the odds of being high saving by –1.26 for an odds ratio of .284 or a 71% percent decrease in odds of being high saving (100 *(odds ratio – 1). The overall model was significant (χ^2 = 1,391.4 (5) p <.001). The Hosmer and Lemeshow goodness of fit test for whether the model fit the observed data indicated a good fit for the five factors (χ^2 = 886.4 (8), p <.001). The Nagelkerke pseudo R^2 was 0.622, which was lower but relatively comparable with the R^2 of .70 found in previous research (Kennickell, 1999). The classification plots displayed in Figure 1 indicated correct classification of 88.5% of low saving, 81.6% of high saving and an 85.1% overall correct classification.

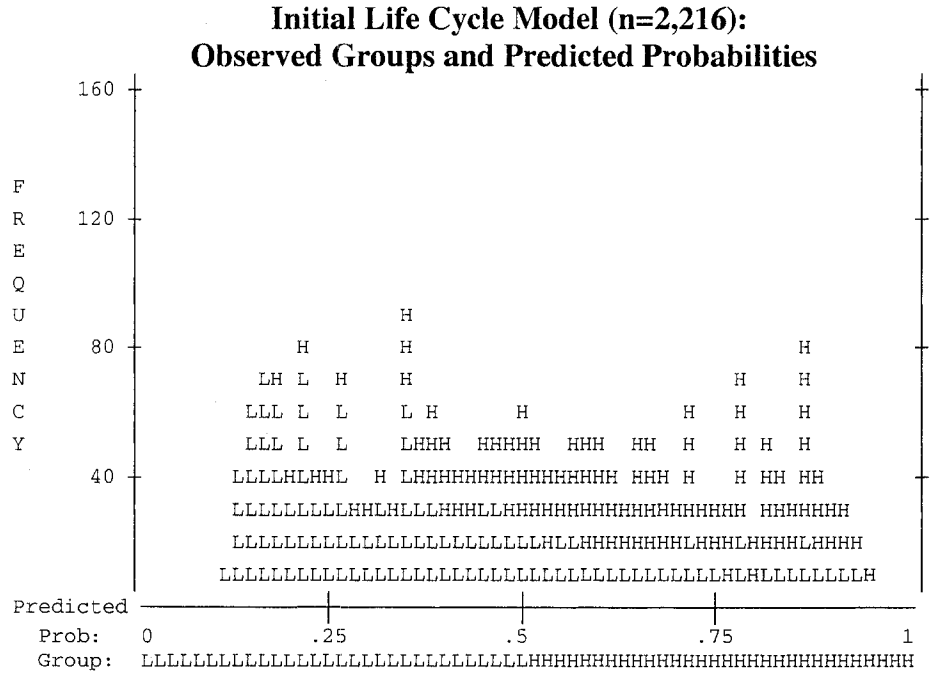
Mental Accounting Hypothesis. A second stepwise binomial logistic regression was conducted for the seven mental accounting variables on the high and low saving quartiles. The second hypothesis was that seven mental accounting variables (regular saving, number of asset accounts, current asset / income ratio, future asset / income ratio, home ownership, estimated savings needs and debt aversion) would have significant and additive effects in predicting high saving versus low saving. This model provided a surprisingly good fit to the data. The Nagelkerke pseudo R^2 for the mental accounting variables was .83.

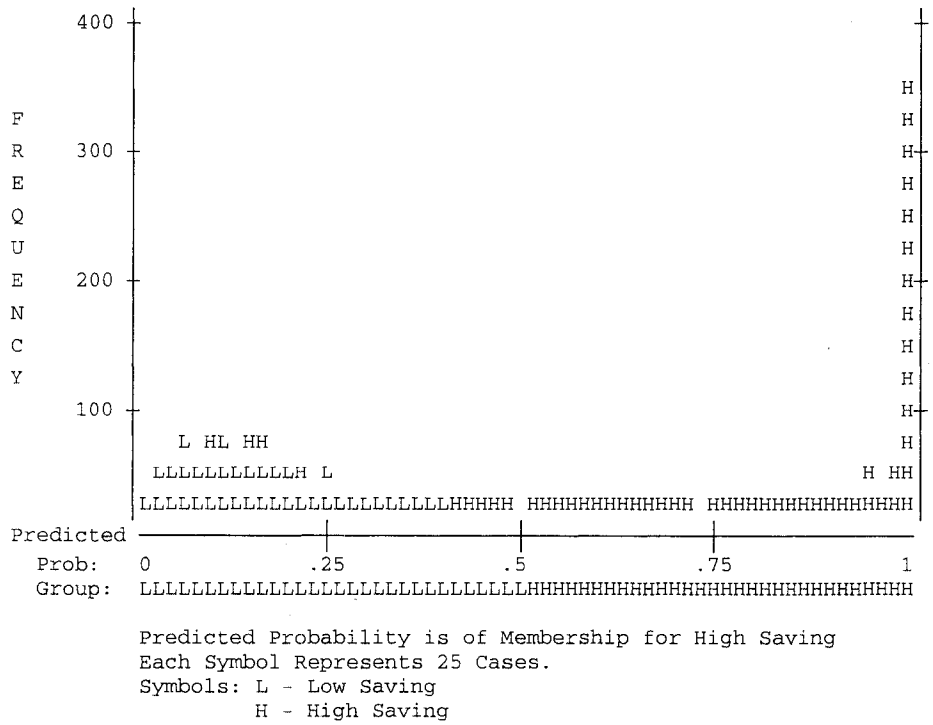
Table 21

Study 2: Logistic Regression Predicting High vs. Low Saving with Life Cycle Variables

Logit estimates			Number of observations	= 2216	
			LR χ^2 (5)	= 1391.47	
			Log likelihood	= 1680.56	
			Pseudo R^2	= .622	
Variable	Coef.	Std. Err.	Wald	*p*	Odds Ratio
Age	.074	.004	308.78 (1)	<.001	1.07
Shocks	-1.26	.109	134.70 (1)	<.001	.284
Income	.000	.000	103.02 (1)	<.001	1.00
Bequest	.198	.041	23.371 (1)	<.001	1.22
Future expectations	.155	.076	4.14 (1)	<.05	1.17
Constant	-4.66	.269	299.41		

Figure 1. Comparison of initial and final life cycle classifications





As seen in Table 22, the logistic regression results supported the mental accounting hypothesis. The forward conditional stepwise model selected five variables (by order of entry: home, accounts, credit use, future assets, current assets) and excluded two (regular saving, saving estimate). The model's prediction equation was Y = -3.73 + 3.48 (home) + 0.469 (accounts) –1.14 (credit use) + 1.40 (future assets) + 3.58 (current assets). The effect of having a home increased the odds of being high saving by 32.6 times. An increase in the assets to income ratio of 0 to 1.0 also was a significant predictor raising the odds of being high saving by 4 times for future assets and by 36 times for current assets. Each additional asset account increased the odds of being high saving by 1.5 times. However, using credit decreased the odds of being high saving by –1.14 for an odds ratio of .318 or a 68% percent decrease in odds of being high saving. The overall model was significant (χ^2 = 2,174.5 (5) p <.001). The Hosmer and Lemeshow goodness of fit test for whether the model fits the observed data indicated a good fit for the five factors (χ^2 = 6,272.5 (8), p <.001). The classification plots displayed in Figure 2 indicated correct classification of 92.5% of low saving, 92.8% of high saving and an 92.6% overall correct classification.

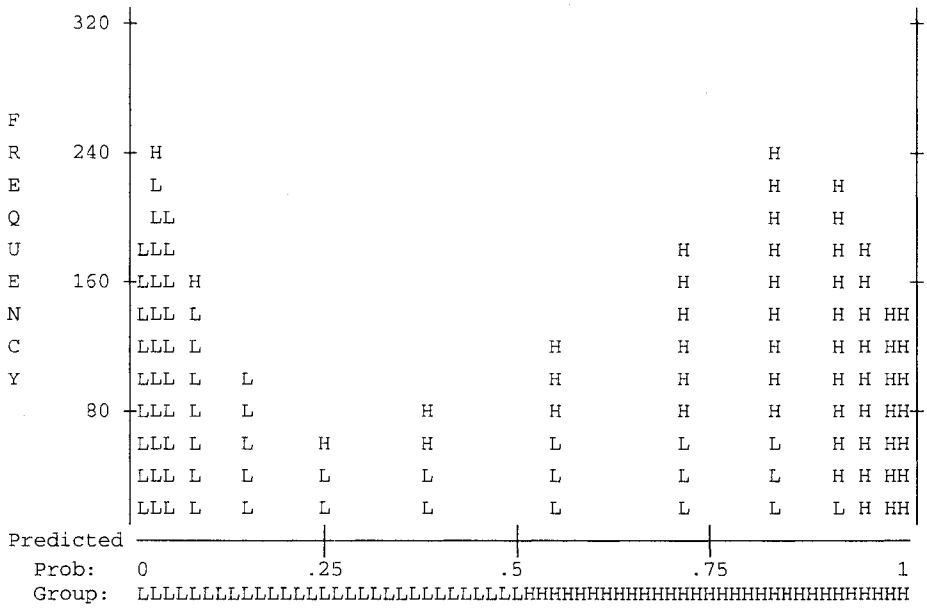
Life Cycle vs. Mental Accounting Hypothesis. The third hypothesis was that the life cycle and mental accounting models would not be equally effective in predicting high versus low saving. Comparisons of the Hosmer and Lemeshow goodness of fit statistics for the mental accounting model (χ^2 = 6,272.5 (8), p <.001) and the life cycle model (χ^2 = 886.4 (8), p <.001) indicated they were not equivalent models which supported the life cycle versus mental accounting comparison hypothesis. Further, the –2 log likelihood (-2LL), that reflects error associated with the model after the independent variables are

Table 22
Study 2: Logistic Regression Predicting High vs. Low Saving with Mental Accounting Variables

Logit estimates			Number of observations		= 2216
			LR χ^2 (5)		= 2174.50
			Log likelihood		= 897.52
			Pseudo R^2		= .834
Variable	Coef.	Std. Err.	Wald	*p*	Odds Ratio
Home	3.486	.221	249.79 (1)	<.001	32.66
Number of accounts	0.469	.053	76.83 (1)	<.001	1.60
Credit use	-1.145	.124	84.63 (1)	<.001	.318
Future asset/income	1.407	.200	49.54 (1)	<.001	4.08
Current asset/income	3.589	.546	43.20 (1)	<.001	36.20
Constant	-3.73	.242	237.84		

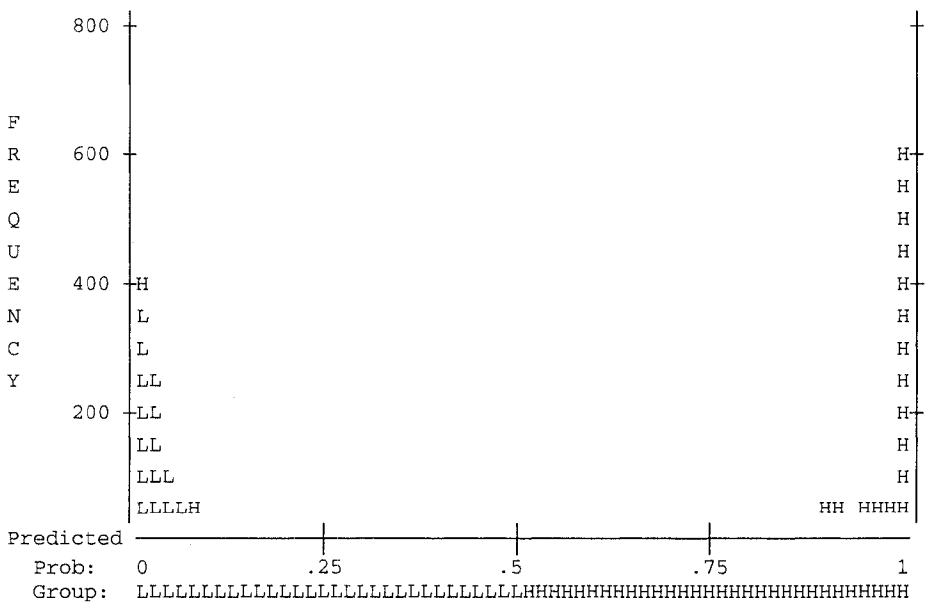
Figure 2. Comparison of initial and final mental accounting classifications.

Initial Mental Accounting Model (n=2,216):
Observed Groups and Predicted Probabilities



Predicted Probability is of Membership for High Saving
Each Symbol Represents 20 Cases.

Final Mental Accounting Model (R^2 = .834, n=2,216)
Observed Groups and Predicted Probabilities



Predicted Probability is of Membership for High Saving
The Cut Value is .50
Symbols: L - Low Saving
H - High Saving
Each Symbol Represents 50 Cases.

included was approximately cut in half by the mental accounting model –2LL = 897.5 versus the life cycle model –2LL = 1,680.5. The results supported the conclusion that life cycle and mental accounting models were not equivalent.

Life Cycle and Mental Accounting Hypothesis. It was hypothesized that a model combining life cycle and mental accounting factors (14 variables) would improve the prediction of high and low savings beyond the level of either model alone. It was also expected that the life cycle variables would have the largest effects and precede the entry of mental accounting factors in stepwise models.

Table 23 displays the logistic regression results for the life cycle and mental accounting regression. When the combined mental accounting and life cycle binomial logistic regression was calculated, however, the improvement in predicting high versus low saving was marginal. Nine of the 14 variables met the forward conditional criteria of probability less than 0.05 and entered the model (in order of entry): home, accounts, credit use, future assets, shocks, age, current assets, bequest, income. Five variables (kids, expectation, precautionary, regular saving, saving estimate) were excluded.

The final prediction equation was Y = -4.56 +2.98 (home) + 0.283 (accounts) - 0.833 (credit use) + 1.32 (future assets) – 0.732 (shocks) + 0.19 (age) + 3.41 (current assets) + 0.186 (bequest) + 0 (income). Holding the effect of income constant, having a home increased the odds of being high saving 19.7 times. The odds of being high saving were also increased 1.3 times for each additional asset account, by 1.02 times for each year older and 1.2 times for each unit increase in the rating of bequest importance. Having a high current asset (30.5 times) and future asset (3.7 times) ratio also increased the odds of being high saving. Every consumption shock decreased the odds ratios of

Table 23

Study 2: Logistic Regression Predicting High vs. Low Saving with Life Cycle and Mental Accounting Variables

Logit estimates			Number of observations	= 2216
			LR χ^2 (5)	= 2276.21
			Log likelihood	= 795.31
			Pseudo R^2	= .856

Variable	Coef.	Std. Err.	Wald	*p*	Odds Ratio
Home	2.981	.232	164.82 (1)	<.001	19.70
Number of accounts	0.283	.060	22.04 (1)	<.001	1.33
Credit use	-.833	.136	37.25 (1)	<.001	.435
Future asset/income	1.32	.196	45.31 (1)	<.001	3.74
Shocks	-.732	.155	22.33 (1)	<.001	.481
Age	.019	.006	8.26 (1)	<.01	1.02
Current asset/income	3.42	.542	39.75 (1)	<.001	30.50
Bequest	.186	.062	9.11 (1)	<.01	1.20
Income	.000	.000	16.99 (1)	<.001	1.00
Constant	-4.56	.435	109.99		

being high saving (-62%) as did credit use (-67%). As can be seen, the mental accounting factors (home, accounts, credit use, future assets) had the largest predictive effects and were entered on the first four steps of the model. The next two steps (shocks, age) were life cycle variables. The overall model was significant (χ^2 = 2,276.5 (5) p <.001). The –2 log likelihood measure of error was 795.3 for the combined model. The goodness of fit test indicated a good fit for the nine factors (χ^2 = 9,226.7 (8), p <.001). The classification plots displayed in Figure 3 indicated correct classification of 93.2% of low saving, 95.0% of high saving and an 94.1% overall correct classification. Table 24 summarizes the hypotheses and results from Study 2.

Finally, although not specifically hypothesized, the interviews in Study 1 and previous research (Hinz, McCarthy & Turner, 1997; Sunden & Surette, 1998) indicated the potential for individual differences by sex. This raised the question of how robust the findings would be if the sample were divided into males and female groups. The 2,216 high and low saving individuals were subsequently divided into male (1,671 or 75%) and female groups (545 or 25%), which corresponded approximately to the general proportion found in the overall sample (78% male, 22% female). An exploratory analysis for the life cycle and mental accounting model was rerun for males and females. As seen in Table 25 the results for males (R^2 = .82; 93% correct classification) and females (R^2 = .77; 92% correct classification) for mental accounting factors were comparable to the original mental accounting model (R^2 = .83; 93% correct classification). However, as seen in Table 26, the life cycle model was affected by sex. Life cycle factors for males (R^2 = .65; 86% correct classification) were similar to the life cycle model (R^2 = .62; 85% correct classification), but differed from females (R^2 =.28; 81% correct classification).

Figure 3. Comparison of initial and final combined model classifications.

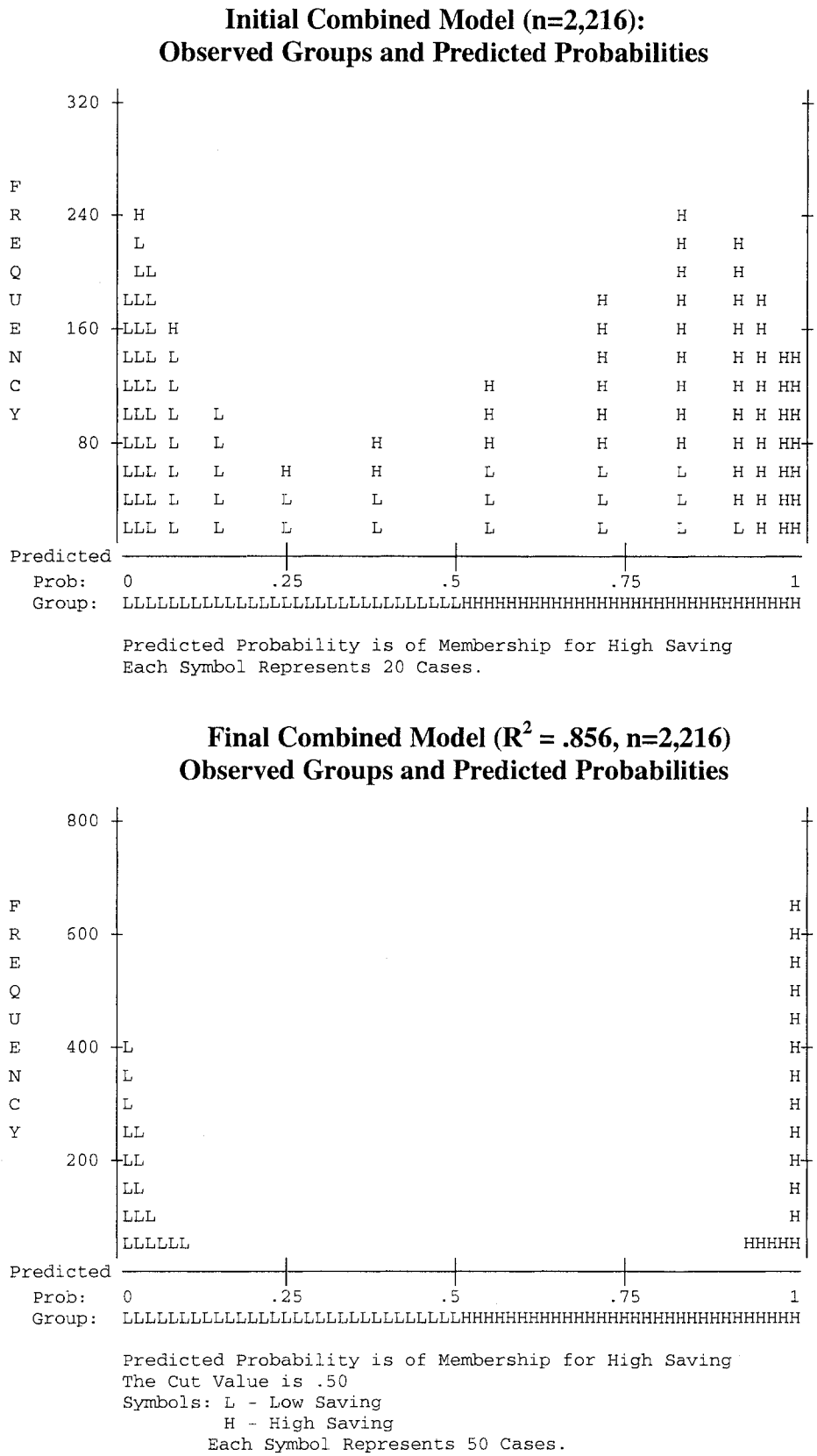


Table 24
Study 2: Summary of Hypotheses and Results

Hypothesis	Result
H1: Life Cycle: Life cycle factors would identify high / low saving	Supported
H2: Mental Accounting: Mental accounting factors would identify high / low saving	Supported
H3: Life Cycle vs. Mental Accounting: Life cycle and mental accounting models would differ significantly in identifying high / low saving	Supported
H4: Life Cycle and Mental Accounting: Combining life cycle and mental accounting models would improve identification of high / low saving	Supported

Table 25

Study 2: Logistic Regression Predicting High vs. Low Saving with Mental Accounting Variables for Males and Females

Male

Logit estimates

Number of observations	= 1671
LR χ^2 (5)	= 1549.6
Log likelihood	= 714.5
Pseudo R^2	= .815

Variable	Coef.	Std. Err.	Wald	*p*	Odds Ratio
Home	3.49	.260	180.3 (1)	$p < .001$	33.06
Number of accounts	.427	.058	53.9 (1)	$p < .001$	1.53
Credit use	-1.28	.147	76.3 (1)	$p < .001$	.277
Future assets/income	1.46	.218	44.5 (1)	$p < .001$	4.29
Current assets/income	3.24	.579	31.3 (1)	$p < .001$	25.55
Constant	-3.31	.285	134.8		

Female

Logit estimates

Number of observations	= 545
LR χ^2 (4)	= 2276.21
Log likelihood	= 795.31
Pseudo R^2	= .856

Variable	Coef.	Std. Err.	Wald	*p*	Odds Ratio
Home	3.72	.410	82.3 (1)	$p < .001$	41.19
Number of accounts	.721	.128	31.5 (1)	$p < .001$	2.05
Credit use	-1.18	.235	25.3 (1)	$p < .001$	.307
Future assets/income	1.14	.523	4.78 (1)	$p < .001$	3.14
Constant	-4.27	.459	86.52		

Table 26

Study 2: Logistic Regression Predicting High vs. Low Saving with Life Cycle Variables for Males and Females

---

Male
Logit estimates

Number of observations	= 1671
LR χ^2 (5)	= 1102.9
Log likelihood	= 1161.2
Pseudo R^2	= .651

Variable	Coef.	Std. Err.	Wald	*p*	Odds Ratio
Age	.079	.005	211.3 (1)	$p<.001$	1.08
Shocks	-1.13	.142	85.8 (1)	$p<.001$	0.26
Income	.000	.000	81.8 (1)	$p<.001$	1.00
Bequest	.203	.049	17.1 (1)	$p<.05$	1.13
Constant	-4.89	.342	205.2 (1)		

Female
Logit estimates

Number of observations	= 545
LR χ^2 (3)	= 112.4
Log likelihood	= 474.6
Pseudo R^2	= .283

Variable	Coef.	Std. Err.	Wald	*p*	Odds Ratio
Age	0.064	0.007	86.4 (1)	$p<.001$	1.07
Shocks	-0.71	0.175	16.3 (1)	$p<.001$	0.49
Bequest	0.225	0.079	8.1 (1)	$p<.01$	1.25
Constant	-4.58	0.475	92.8 (1)		

Discussion

This study used a new saving index outcome measure and developed two theoretically based models (life cycle and mental accounting) to predict high versus low saving levels in the 2001 Survey of Consumer Finances. The results indicated that variables generated from mental accounting psychology were very effective in predicting and classifying high and low saving individuals.

The saving index used in this study created saving groups that did not conform to the hump-shaped age and income profile predicted by life cycle economics. The normative life-cycle approach prescribed that saving corresponded to a rational allocation of wealth and income over time according to demographic factors. As a result, saving has been predominantly described as a function of demographics; demographic groups divided the sample first, then saving was measured. In contrast, the saving index did the reverse; relative saving levels divided the sample first, then characteristics associated with each saving level were measured. This procedure followed the descriptive psychological approach pioneered by Kahneman and Tversky (1979) and extended by Thaler and Shefrin (1988). Observations of behavior and saving anomalies have indicated that rational assumptions of maximizing consumption utility by age, income, wealth and demographics did not hold under many circumstances (Thaler, 1992). Furthermore, the factors used in decision making and saving models have moved away from objective factors or end states toward subjective perceptions of changes from one state to another. Thus, saving decisions were framed in relative and not objective terms (Kahneman & Tversky, 1984).

The saving index ratio of actual to expected net worth provided a measure of savings relative to each individual. This approach was not restricted by age, income or other demographics. The saving index often paired individuals who were similar psychologically but very different demographically. For example, saving index scores of 2.9 (actual net worth was 2.9 times expected net worth) were shared by the following high-saving SCF respondents:

- 88 year-old White widowed female with a high school degree and no children earning $11,800/year
- 54 year-old Black married male with a college degree and one child earning $277,000/year
- 40 year-old White married male with a college degree and three children earning $7.9 million/year

Age, income, race, education, marital status or number of children would have placed most of these individuals into separate groups even though their relative saving levels were equivalent. The saving index used in the current study extended research using ratio outcome variables to study saving (Bae, Hanna & Lindamood, 1997; Bernheim, Skinner & Weinberg, 1997; Hilgert, Hogarth & Beverly, 2003; Kennickell, 1999) and the saving index separated the sample into groups with significantly different saving levels and characteristics.

Both life cycle and mental accounting models described saving as a multivariate cognitive process with interdependent factors. When viewed as a cognitive process, both approaches implied different representations of wealth evident in saving decisions and asset allocations. For the life cycle saver, wealth was fungible and pooled together. For

the mental accounting saver, wealth was organized into separate accounts of income, current assets and future assets. The three predictive models compared saving outcomes associated with theoretical life cycle and mental accounting representations of wealth. The results indicated that SCF respondents treated components of their wealth differently and that asset categories had different effects in separating high and low saving as predicted by mental accounting.

The first regression model illustrated that the life cycle variables: age, bequest, children, future expectations, income and consumption shocks, significantly predicted high versus low saving on the saving index. Not surprisingly, the life cycle model detected significant demographic differences between high and low saving groups. In comparison with low saving, high saving people were significantly older and had higher incomes and fewer consumption shocks. Modigliani (1985) succinctly described this life cycle expectation in the case of a stationary economy, "the aggregate wealth-income ratio, W/Y, is given by the ratio of the sum of wealth held at each age" (p. 301). High saving people also had fewer children and felt bequests were more important which replicated life cycle trends found in other research (Browning & Lusardi, 1996; Deaton, 1992; Kennickell, 1995, 2001).

The second regression model, however, provided support for mental accounting. The mental accounting variables: number of asset accounts, credit use, current asset to income ratio, future asset to income ratio and having a home, were strong predictors of being high or low on the saving index. High saving was associated with more asset accounts, higher future and current asset to income ratios as well as having a house and not using credit. Among the SCF participants, different asset categories had different

effects in predicting saving levels. The successful mental accounting saver was expected to be adept at transferring cash into categories that were less likely to be spent like current asset accounts (checking, savings, money market), future assets (pension, thrift plan, IRA) or a home. The results indicated that the odds of being a member of the high saving group were improved relative to the liquidity of the asset. The value of illiquid assets like future pensions, thrift plans, IRAs increased proportionally between the bottom and top saving index quartiles.

As Shefrin and Thaler (1988) predicted, assets displayed different propensities to be consumed. Given that current assets are most likely to be consumed, a person with a higher current asset to income ratio was proportionally more likely to be high saving than a person with the same future asset to income ratio. In other words, the mental accounting model illustrated that it was more difficult to find people whose current asset to income ratio was high than it was to find people whose future asset to income ratio was high. In addition, the mental accounting model indicated differences between high and low saving groups could be standardized and predicted using income as a subjective reference point instead of an absolute measure. This approach corresponded to prospect theory's psychophysics of choice that decisions were evaluated as a gain or loss from a subjective reference point (Kahneman & Tversky, 1979).

Finally, in contrast to life cycle predictions of using debt to smooth consumption, high saving individuals were more debt averse than low saving individuals. High saving individuals self-restricted credit use (borrowed less than was possible or borrowed nothing at all) more often than low saving as Shefrin and Thaler (1988) predicted. The mental accounting model also provided evidence for a cognitive, heuristic process

underlying the organization and accumulation of wealth. The asset account variable simply tallied the number of separate accounts or asset types (stocks, bonds, cds, etc.) into which wealth was allocated. High saving individuals demonstrated a greater expertise in creating and funding a larger network of asset accounts than low saving individuals. In a life cycle model, the number and labeling of asset accounts should not separate high and low saving individuals given that people pool income and assets to set a long term spending level. Overall, these findings contributed to a growing literature applying mental accounting (Shefrin & Thaler, 1988) and prospect theory (Kahneman & Tversky, 1979) in secondary analyses of nationwide data sets (e.g., Bernheim, Skinner & Weinberg, 1997; Chaulk, Johnson & Bulcroft, 2003).

Comparing the life cycle versus mental accounting results demonstrated that two models with a similar number of predictors (7 each) differed significantly in their ability to identify high versus low saving individuals. Furthermore, when the life cycle and mental accounting models (14 variables) were combined, it did not greatly improve the prediction of high and low savings beyond the mental accounting model. Nine variables met the criteria for inclusion in the combined stepwise model. The first four were mental accounting variables (home, accounts, credit use and future assets). The life cycle variables entered the model on the fifth (shock), sixth (age) and ninth (income) steps. These results demonstrated mental accounting variables were viable predictors of high and low saving independent of life cycle factors like age and income. The final exploratory analysis also indicated the potential for sex differences and that female heads of households may evaluate saving decisions differently than male heads of households.

Future research on the extent to which sex mediates or moderates saving decisions may be warranted.

A limitation for the quantitative analyses is that the Survey of Consumer Finance is a cross-sectional survey and does not perform repeated measures on the same individuals over time. Different results may be obtained with a panel data set. This study was also limited by the fact that the study was not an experiment. The design and statistics showed correlation and allowed prediction, but could not be used to assess causation. The results have shown that mental accounting variables could be applied successfully in a predictive model of saving. Other potential explanations for these results, however, were not excluded by this experimental design.

Another potential limitation was that as a result of how the variables were constructed, some predictor variables were partially related to the outcome variable (saving index: actual/expected net worth) for both the life cycle (income, age) and mental accounting (current assets / income, future assets / income) models. To some degree, interrelated variables reflect the nature of what is studied. Financial outcomes like saving are multivariate and depend upon the cumulative effects of many variables over time. As Kennickell (1999) noted in research using the SCF, finding one variable that accounted for most of the variance exclusively was more difficult than finding many variables that accounted for some variance in combination with many others. Economists have described this problem in terms of endogenous variables (value of variable depends upon other variables) and exogeneous variables (value of variable is independent of other variables). Economic and psychological research design has adapted to fit these

constraints accordingly. The research question of this study was articulated with the partially endogenous nature of saving predictors and outcomes in mind.

The life cycle and mental accounting models outlined a cognitive process for making saving decisions and accumulating wealth. Studies using these models have generally gauged the extent to which the model fit and organized empirical data. For example, Kahneman and Tversky primarily used demonstrations to illustrate prospect theory's effects in the decision making process. Prospect theory consistently described, predicted and explained the outcomes of the demonstrations (Kahneman & Tversky, 1979, 1984, 2000). Similarly, the question for this study was not whether predictor and outcome variables were interrelated. The question was whether variables specified by mental accounting and life cycle theories were interrelated as the theories would predict and how useful each variable would be in identifying members of high saving and low saving groups.

The analysis, design and variables used in Study 2 reflected this research question. Nonparametric statistics that would not violate a linear model's assumptions were used. An ordinary least squares regression would assume that predictors and outcomes are independent to determine whether a change in a predictor produced a corresponding linear change in an outcome. In contrast, logistic regression generates a maximum likelihood estimate of the probability for a certain binomial outcome (0,1) to occur. Logistic regression calculates the changes in the log odds of the dependent, not changes in the dependent itself as linear regression would. Thus, many assumptions of linear regression (linearity, normal distributions and homoscedasticity) for the variables did not apply for this analysis. For example, the SCF data accurately reflected the skew

of income and wealth (Kennickell, 2001), but given the rank order nature of the saving index quartiles and that logistic regression measured changes in odds and not variables, it was not necessary to transform income to perform the analysis. The rank orders of income, log of income and the square root of income would be equivalent. The saving index was also not comprised of a single variable. The saving index was a ratio of actual net worth less inheritance relative to expected net worth for one's age and income. Converting variables into ratios, counts, dummy codes (0,1) and rank orders standardized measures and made individuals at different ends of the income and wealth spectrum comparable.

Although an asset-based predictor and an asset-based outcome appear tautological, the mental accounting model's results indicated very different odds ratios by type of asset. Despite being asset-based measures, the ratio of asset values relative to income (current assets, future assets), the number of asset accounts and having a house all had different effects in separating high and low savers. People appeared to label and treat assets differently instead of treating assets as fungible. Overall, asking people for current and future asset ratios relative to income, the number of asset accounts, if they own a home and if they use credit was a very effective classification strategy. Mental accounting predicted these asset allocations and this strategy would not have been suggested by a life cycle account. However, the observed relations may be inflated due to overlapping components among independent and dependent measures. Future research may provide additional mental accounting independent variables with less overlap with dependent measures decreasing the possibility of inflated values due to part/whole correlation.

The models tested were incomplete representations of the theory. The variables selected had to meet competing demands. Not only did the variables need to have a basis in the theory, but they also had to have been measured in the data set. Again, the use of proxy variables such as counting the number of separate asset accounts as opposed to calculating the sums of money deposited in each served as a good indicator. The models tested also were incomplete representations of all possible variables that could possibly have had an effect on saving such as receiving an inheritance, getting professional advice, sex, race and so forth. As noted earlier, the exception in multivariate, nationwide survey research with large samples were the variables that did not have some effect on saving. Therefore, selecting model components was more an exercise of exclusion than inclusion.

Each variable selected had either been used in previous saving research, was tied explicitly to either the life cycle or mental accounting theories, or was specified in qualitative interviews in Study 1 (e.g., a house was an important separate asset that was treated differently). The models that resulted from theoretically selected variables were parsimonious and contained fairly good predictors of high and low saving (greater than 85% correct classification of cases and relatively high proportions of variance accounted for). However, it can be argued that assignment of a variable to one model or the other depended upon an arbitrary interpretation of the life cycle or mental accounting approach. In other words, certain factors could be placed into either model. Future research could refine the application of mental accounting concepts to selecting predictor variables in national datasets. Additional basic research on the underlying structure and relations among the variables is obviously required.

A final potential limitation of this study was that the comparison was restricted only to low and high saving groups. Given the exploratory nature of the mental accounting variables and that small incremental effects beyond age and income were expected, only the top and bottom quartile were tested instead of the whole sample to increase the chances of detecting a difference. While comparing only the top and bottom quartiles may be perceived as a limitation, Carroll (1998) has argued that focusing on the saving of the wealthy is a sound analytic strategy:

> The saving behavior of the wealthy has received remarkably little academic attention in the past twenty years or so...Despite recent neglect, the topic is an important one for scholars of saving behavior, for at least two reasons. First, wealthy households should provide a powerful means of testing whether the standard model of consumer behavior, the Life Cycle/Permanent Income Hypothesis, is adequate as a universal model of saving and consumption. This is an application of the general scientific principle that models should be tested under extreme conditions; if they do not hold up, a new model (or an extended version of the old one) is called for. The second reason for studying the wealthy is that they account for a large share of aggregate wealth. In fact, some understanding of the saving behavior of the wealthy is probably indispensable to any credible attempt to account for the magnitude of aggregate wealth (p. 1)

Future research may apply mental accounting variables to predict saving in the entire sample.

CHAPTER IV

GENERAL DISCUSSION

American saving levels vary widely. At one end of the continuum is a minority who successfully save and at the other end, a majority who save very little (Attanasio, 1994; Browning & Lusardi, 1996). Americans are not alone. Many other countries have similar distributions of saving and wealth accumulation (Schmidt-Hebbel & Serven, 1999). The primary question for this research, then, was what variables can be used to accurately predict high saving versus low saving? The economic answer was that people rationally smooth wealth consumption to a constant level over time (Modigliani & Brumberg, 1954). Thaler (1992) reduced the economic life cycle hypothesis to an annuity of total wealth divided by expected years left to live. Stated this way, the saving continuum primarily depends on demographics (wealth and position in the life-cycle). To date, most American data sets (e.g., Panel Study of Income Dynamics, Survey of Consumer Finances, Consumer Expenditure Survey, Survey of Investment Program Participation, etc.) were primarily split, tested and reported according to demographic variables even though there was data collected on attitudes, behaviors and other factors. Life-cycle assumptions dominated how saving was reported and how saving groups were formed. In comparison to saving, product marketing incorporated a wide array of psychological and other factors to effectively target consumers and influence behavior (Kotler, 1997). While the psychology of spending is highly evolved, the psychology of saving is comparatively embryonic. This research was designed to increase the

understanding of high and low saving levels with concepts generated from mental accounting psychology (Kahneman & Tversky, 1979; Shefrin & Thaler, 1988).

The movement toward psychological variables in both decision making and saving has been a meta-trend. Theories of decision making began with expected value in the early 1700s and developed later into expected utility. Rational models for maximizing expected utility were developed (Von Neumann & Morgenstern, 1947) and subsequently challenged by Kahneman and Tversky's (1979) prospect theory (Gigerenzer et al., 1993; Kahneman & Tversky, 1984; Lopes, 1994). Decision making theory has progressed from objective variables that were rationally and economically evaluated toward subjective variables that were heuristically and psychologically evaluated. The assumptions underlying decision making were subsequently applied to understand and predict saving. Economic life cycle models of saving (Modigliani & Brumberg, 1954) assumed a rational agent maximizing utility by evaluating life cycle factors (age, income, future expectations, et al.) to make spend / save decisions. In contrast, psychological mental accounting models (Shefrin & Thaler, 1988) of saving assumed a cognitive miser using heuristics to make save / spend decisions that often appear irrational. The results of both studies presented here provided new evidence that saving decisions were not experienced as a rational life-cycle assessment of wealth and that mental accounting significantly distinguished high and low saving individuals.

The qualitative results of Study 1 generally supported the mental accounting approach to saving. The 24 participants indicated that saving was largely self-taught, experience-based and heuristic. Respondents reported that attributional processes, emotional responses to events, learning and adult development influenced their saving.

Saving was not described in life cycle terms as a rational agent assessing wealth and future expectations to set a long-term spending level. Most approaches to saving were relatively uncomplicated and geared to provide short-term control of spending (automatic payroll deduction, separate accounts, paying one-self first, etc.). Life cycle saving motives like bequests and precautionary saving also were not prominent in people's explanations of how and why they saved. This study extended the findings of Kennickell, Starr-McClure, & Sunden, (1996) and offered an additional qualitative perspective on saving that supported mental accounting (Thaler, 1999). Despite being infrequently applied, smaller scale qualitative research greatly enhanced the findings and illustrated the value of a multi-method measurement approach to saving (Campbell & Fiske, 1959). Future exploratory research on mental accounting heuristics, strategies and influential factors may profit from including a qualitative pre-test.

For example, Study 1 suggested some new factors that were not explicit in the life cycle or mental accounting studies. Participants mentioned that their saving was often strongly motivated by an ethical or moral component. Many participants felt saving was a social duty to prevent dependence upon others. Others felt a religious or spiritual responsibility not to waste what one is given. Still others described their saving ethic in environmental terms; conserving resources saves money and assures others can enjoy them in the future. The presence of a saving ethic was strong and pervasive. An individual's saving ethic did not necessarily fit into Keynes' (1936) motives, Modigliani and Brumberg's (1954) life cycle hypothesis nor the mental accounting theory (Shefrin & Thaler, 1988). It may in fact correspond to earlier ideas on the psychology of saving proposed by Katona (1951, 1975) regarding willingness to save. Etzioni (2003) has also

proposed a new socio-economic view that people are not just motivated by the invisible hand of self-interest or greed and that many economic motivations also stem from a sense of moral duty. Future research may include variables that test the level of importance attached to saving and the extent to which this is influenced by an individual's moral or ethical motivation.

In contrast, Study 2 presented quantitative evidence that new variables based upon mental accounting theory could successfully predict high versus low saving in the nationwide 2001 Survey of Consumer Finances. The addition of new variables to predict and explain saving variation was significant. As Bernheim, Skinner and Weinberg (1997) have noted, heterogeneous variation in saving is to be expected, but:

> ... the interpretation of this variation is of paramount importance. If one takes the view that saving reflects rational, farsighted optimization, then low savers are simply expressing their preferences for current consumption over future consumption – one cannot coherently claim that they are saving "too little" ... any more than one can assert that people would be better off if they spent more time listening to classical music. However, if one takes the view that households are shortsighted, irrational, prone to regret, or heavily influenced by psychological motives, then the adequacy of saving among various population subgroups emerges as an important and potentially well-posed empirical question (Bernheim, Skinner & Weinberg, 1997, 1).

The results of Study 2 contributed to a growing body of literature indicating mental accounting effects in large data sets. The strength of the asset account variable demonstrated that people who tended to create and maintain a larger and more intricate

network of asset accounts tended to have higher savings. These results corresponded with Hilgert, Hogarth & Sandra's (2003) findings that people with higher knowledge about the process of saving were more likely to be in a high saving group. Also, in a life-cycle model, households should pool assets and make saving and investment decisions simultaneously to optimize their life resources. Chen, Hanna and Montalto (1998) demonstrated no significant interrelation between household saving decisions and portfolio allocation decisions. Similarly, in Study 2, the strength of the asset accounts variable provided further evidence that people maintain separate accounts and make separate decisions about these accounts supporting the mental accounting approach to saving.

As Shefrin and Thaler (1988) observed in their model of mental accounting, the key to saving is transferring income into less liquid current asset and future income accounts where it is less likely to be spent. This aspect of the mental accounting model was strongly supported by the current assets/income, future assets/income indicator and home variables. People's overall net worth as measured by the saving index (which scaled for debt, inheritance, age and income) clearly demonstrated households who were high saving were very proficient at converting income into less liquid assets and self-restricting the use of credit/debt as would be expected by mental accounting theory. This formula for saving success was not limited to the wealthy or to people of a certain age. Creating a saving index that gauged the proportion of actual net worth to expected net worth, created groups of savers who were psychologically similar but demographically different. Mental accounting variables consistently separated these diverse groups. The effectiveness of the mental accounting predictive model, while very good in classifying

high versus low saving, was not absolute. At the extreme high and low ends of saving, there was considerable variation and some threshold effects (e.g., a certain level of income). Trimming these extreme groups in future analyses may temper the model and provide better estimation for the middle groups not examined in this study.

Prospect theory (Kahneman & Tversky, 1979) illustrated a psychophysics of chance and choice derived from a relative reference point. Using current income as a reference point as suggested by Thaler (1999a) also provided insight to what separated high from low saving levels. Each of the saving index quartiles displayed significant differences on variables using income as the denominator in financial ratios. This reaffirmed psychological research indicating people's status quo provides a primary reference for framing subsequent saving or spending decisions (Kahneman, 2002). Mental accounting (Shefrin & Thaler, 1988) proposed a cognitive ledger for wealth with different propensities to consume depending on account. The mental accounting variables based upon an income, current asset and future asset account framework provided a practical means for measuring and predicting high saving levels versus low saving levels. In sum, the results of both studies supported the use of prospect theory and mental accounting to better understand saving behavior.

An implication of this research is the value of an interdisciplinary approach. Psychologists and economists willing to go beyond the traditional boundaries of their disciplines have made significant contributions that are now being recognized. Psychologist Daniel Kahneman was awarded the 2002 Nobel memorial prize in economics "for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty".

Kahneman's (2002) Nobel lecture provides a psychological framework for decision making and concludes that such a framework "can be useful if it guides a principled search for analogies across domains, to identify common processes and to prevent overly narrow interpretations of findings." (p. 483). Interdisciplinary psychology and economic studies that once were the exception may soon become the rule.

Another implication of this research is that mental accounting differences between high and low saving groups may help explain the limited success of saving initiatives. Groups formed by the saving index in Study 2 contrasted sharply to the age-based groups proposed by the Department of Labor's 2002 National Summit on Retirement Savings (Millennials, Generation X, Baby Boomers and the Silent Generation) and other studies that classified saving groups (AARP, 1999; Campbell & Mankiw, 1991; Weil, 1991). Browning and Lusardi (1996) after reviewing the saving literature concluded that the vast majority of Americans arrive at retirement age with no savings. Furthermore, employers have cut pensions and retirement benefits, so people increasingly need to plan their own retirements. National saving policies and the efforts of private associations to improve saving are predicated upon understanding saving variation and correctly classifying individuals into meaningful groups. These efforts may benefit greatly by incorporating mental accounting. For example, Thaler (1994) has observed that some recent government programs that improve saving such as 401ks, apply mental accounting principles like automating decisions, rewarding saving and reducing the need for self-control.

Psychologically enhanced saving programs and educational initiatives have a nationwide value. Deaton (1999), in reviewing the relationship between savings and growth, notes:

> Most governments and policy makers appear to regard growth as a good thing per se. A necessary (but certainly not sufficient) condition for growth is investment, in machines, in people, or in both. In a closed economy, these investments can come only from postponing consumption, that is from saving. ... If so, it is a short step to the conclusion that saving drives growth, and that the appropriate policies for growth are those that promote saving (p.33)

Therefore, expanded application of mental accounting may provide better understanding of individual differences in saving and yield more effective financial education. Mental accounting measures of saving are also well suited for self-diagnosis and comparison with others. Within every demographic group there is variability in saving. People can gauge what separates them from similar others who save more or save less using a few simple measures.

In conclusion, a growing body of evidence across studies, disciplines and nations has indicated saving and wealth accumulation are strongly influenced by an individual's choices and reflect a cognitive decision process. Behavioral science, though, has yet to overcome many myths about saving and wealth accumulation. Many people assume economic outcomes are predestined. Regardless of individual choices, wealth is actually an inevitable result of ancestry, inheritance, luck, income, age, education, government policy, profession or social status. Causal assumptions about wealth manifest themselves in overgeneralizations such as low-income households *never* save and high-income

households *always* save which researchers must address (e.g., Carroll, 1998; Sherraden, M. & Beverly, S.G. 2000).

However, continued research on saving and wealth accumulation may help to dispel many misconceptions. For example, Stanley and Danko (1996) discovered that real millionaires (net worth in excess of $1 million) did not fit existing stereotypes:

> Most people have it all wrong about wealth in America. Wealth is not the same as income. If you make a good income each year and spend it all, you are not getting wealthier... Wealth is what you accumulate, not what you spend. How do you become wealthy? Here, too, most people have it wrong. It is seldom luck or inheritance or advanced degrees or even intelligence that enables people to amass fortunes. Wealth is more often the result of a lifestyle of hard work, perseverance, planning, and, most of all, self-discipline (Stanley & Danko, 1996, p1).

Counter to commonly held beliefs, for 80% of millionaires, wealth was self-made in one generation without an inheritance or lucky windfall. Most millionaires lived well below their means and heuristically created "an environment of economic scarcity" that provided self-control to minimize spending and debt. Millionaires also displayed expertise at converting income into separate asset accounts that were less liquid and less likely to be spent. For Stanley and Danko (1996), wealth was the result of a lifestyle and decision making process. These findings resonate with many elements of Shefrin and Thaler's (1988) mental accounting theory of saving.

The proposition that wealth accumulation is related to a lifestyle and decision making process is also reminiscent of Banfield's (1968) time-horizon theory and description of social classes. In analyzing the problems of urban development, Banfield

(1968) observed that many of the distinct patterns associated with upper and lower classes stemmed from sharing a similar psychological orientation to the future. Lower classes were observed to be present oriented and upper classes future oriented. Interestingly, Banfield (1968) notes:

> The reader is asked to keep in mind that members of a "class" as the word is used here are people who share a "distinct patterning of attitudes, values, and modes of behavior," *not* people of like income, occupation, schooling or status. (p. 56)

Banfield (1968) concluded that class membership reflected subjective psychology more than objective demographics and that the lower, working, middle and upper classes were tied to a time horizon that was socially transferred.

Perhaps, as mental accounting is disseminated as a process for understanding saving decisions and wealth accumulation, the paradigm for gauging fiscal fitness will change. For example, financial planners now incorporate a client's personal risk tolerance and are asking fewer demographic questions. A new psychological vocabulary surrounding saving decisions has emerged, and, as Thaler (1999b) has observed, it may soon be redundant to say behavioral finance or behavioral economics because there will be no other kind.

References

Aizcorbe, A.M., Kennickell, A.B., & Moore, K.M. (2003). Recent changes in U.S. family finances: Evidence from the 1998 and 2001 Survey of Consumer Finances. *Federal Reserve Bulletin, 89,* 1-32.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhi & J. Beckmann (Eds.), *Action – control: From cognition to behavior* (pp. 11-39). Heidelberg: Springer.

Ajzen, I. (1996). The social psychology of decision making. In E.T. Higgins & A.W. Kruglanski *Social psychology: Handbook of basic principles*. New York: The Guilford Press.

American Association for Retired Persons (1999). *Baby boomers envision their retirement: An AARP segmentation analysis.* Retrieved December 23, 2003 from http://research.aarp.org/econ/boomer_seg_2.html

Attanasio, O.P. (1994). Personal saving in the United States. In J. M. Poterba *International comparisons of household saving* (pp.57-124). Chicago: University of Chicago.

Babeau, A. (1981). Diversite des motivations et evolution des comportements d'epargne. Paris: Centre Recherche Economique Sur l'Epargne.

Bach, D. (2003). *The Automatic Millionaire: A powerful one-step plan to live and finish rich.* New York: Broadway.

Bae, M., Hanna, S., & Lindamood, S. (1997). Patterns of overspending in U.S. households. *Financial Counseling and Planning, 4,* 11-30.

Banfield, E.C. (1968). *The un-heavenly city revisited.* Boston: Little, Brown & Company.

Bell, D., Raiffa, H., & Tversky, A. (Eds.) (1989). *Decision making: Descriptive, normative and prescriptive interactions*. New York: Cambridge University Press.

Bentarzi, S., & Thaler, R. (1995). Myopic loss aversion and the equity premium puzzle. *Quarterly Journal of Economics, 110,* 73-92.

Bernheim, B.D., & Shoven, J.B. (1991). Introduction. In B.D. Bernheim and J.B Shoven *National saving and economic performance* (pp. 1-14). Chicago: University of Chicago Press.

Bernheim, B.D., Skinner, J., & Weinberg, S. (1997). What accounts for the variation in retirement wealth among U.S. households? NBER Working Paper 6227. Cambridge: National Bureau of Economic Research.

Bledsoe, R. (2003). *Making complex data available to users with simple tools: The case of the survey of consumer finances.* Retrieved September 20, 2003, from http://www.federalreserve.gov/pubs/oss/oss2/method.html

Bowman, D., Minehart, D., & Rabin, M. (1999). Loss aversion in a consumption-savings model. *Journal of Economic Behavior and Organization, 38,* 155-178.

Browning, M., & Lusardi, A. (1996). Household saving: Micro theories and micro facts. *Journal of Economic Literature, 34,* 1797-1855.

Burbridge, J.B., & Robb, A.L. (1985). Evidence on wealth-age profiles in Canadian cross-section data. *Canadian Journal of Economics, 18,* 845-875.

Camerer, C.F. (2000). Prospect theory in the wild: Evidence from the field. In D. Kahneman & Tversky (Eds.) *Choices, Values and Frames* (pp. 288-300). Cambridge: Cambridge UP.

Campbell, D.T. & Fiske, D.W. (1959). Convergent and discriminant validation by the multitrait – multimethod matrix. *Psychological Bulletin, 56,* 81-105.

Campbell, J.Y., & Mankiw, N.W. (1991). The response of consumption to income: A cross-country investigation. *European Economic Review, 35,* 723-767.

Carroll, C.D. (1998). Why do the rich save so much? NBER Working Paper 6549. Cambridge: National Bureau of Economic Research.

Carroll, C.D., & Summers, L. H. (1991). Consumption growth parallels income growth: Some new evidence. In B.D. Bernheim and J.B Shoven *National saving and economic performance* (pp. 305-348). Chicago: University of Chicago Press.

Chaulk, B., Johnson, P.J., & Bulcroft, R. (2003). Effects of marriage and children on financial

risk tolerance: A synthesis of family development and prospect theory. *Journal of Family and Economic Issues, 24,* 257-279.

Chen, P., Hanna, S. & Montalto, C. (1998). Do households make saving and investment decisions together? *Consumer Interests Annual, 44,* 96-102.

Chi, M., Feltovich, P., & Glaser, R. (1981). Categorization and representation of physics problems. *Cognitive Science, 5,* 121-152.

Choi, J., Laibson, D., Madrian, B., & Metrick, A. (2001). Defined contribution pensions: Plan rules, participant choices, and the path of least resistance. NBER Working Paper 8655. Cambridge: National Bureau of Economic Research.

Codebook for the 2001 Survey of Consumer Finances. (2003, June 24). Retrieved June 24, 2003, from http://www.federalreserve.gov/pubs/oss/oss2/2001/scf2001home.html

Collins, S.M. (1991). Saving behavior in ten developing countries. In B.D. Bernheim and J.B Shoven *National saving and economic performance* (pp. 349-375). Chicago: University of Chicago Press.

Deaton, A. (1992). *Understanding consumption.* Oxford: Oxford University Press.

Deaton, A. (1999). Saving and growth. In K. Schmidt-Hebbel & L. Serven. *The economics of saving and growth: Theory, evidence and implications for policy* (pp. 33-70). New York: Cambridge University Press.

Department of Labor, The 2002 National Summit on Retirement Savings February 27-March 1, 2002 Washington, D.C., Final Report (2002). *Saving for a lifetime: Advancing generational prosperity.* Retrieved August 1, 2002, from http://www.saverssummit.dol.gov

Dittmar, H. (1992). *The social psychology of material possessions: To have is to be.* New York: St. Martin's Press.

Duesenberry, J. (1949). *Income, saving and the theory of consumer behavior.* Cambridge, MA: Harvard University Press.

Etzioni, A. (2003). Toward a new socio-economic paradigm. *Socio-Economic Review, 1,* 105-

118.

Fisher, I. (1930). *The theory of interest.* London: Macmillan.

Fiske, S. T., & Taylor, S. E. (1991). *Social cognition.* (2nd ed.). New York: McGraw Hill.

Friedman, M. (1957). *A theory of consumption function.* Princeton, NJ: Princeton UP.

Gaerling, T., Karlsson, N., & Selart, M. (1999). The role of mental accounting in everyday economic decision making. In P. Juslin and H. Montgomery (Eds.) *Judgement and decision making: Neo-Brunswikian and process tracing approaches.* Mawah, NJ: Lawrence Erlbaum Associates Inc.

Gigerenzer, G., Sijtnik, Z., Porter, T., Daston, L., Beatty, J., & Kruger, L. (1993). *The empire of chance: How probability changed science and everyday life.* New York: Cambridge UP.

Hall, R.E. (1978). Stochastic implications of the life-cycle – permanent income hypothesis: theory and evidence. *Journal of Political Economy, 86(6),* 971-987.

Hall, R.E., & Mishkin, F.S. (1982). The sensitivity of consumption to transitory income: estimates from panel data on households. *Econometrica, 50(2),* 461-481.

Hilgert, H.A., Hogarth, J.M., & Sandra, B.G. (2003). Household financial management: The connection between knowledge and behavior. *Federal Reserve Bulletin, 89,* 7-21.

Hinz, R.P., McCarthy, D. D., & Turner, J.A. (1997). Are women conservative investors? Gender differences in participant directed pension investments. In M. Gordon, O.S. Mitchell and M. Twinney (Eds.) *Positioning pensions for the Twenty-First century.* Philadelphia: University of Pennsylvania Press.

Kahneman, D. (1992). Reference points, anchors, norms and mixed feelings. *Organizational Behavior and Human Decision Processes, 51,* 296-312.

Kahneman, D. (2002). Maps of bounded rationality: A perspective on intuitive judgment and choice. Retrieved April 4, 2004 from: http://www.nobel.se/economics/laureates/2002.html

Kahneman, D. (2003). Experiences of collaborative research. *American Psychologist, 58,* 723-730.

Kahneman, D., & Lovallo, D. (1993). Timid choices and bold forecasts: A cognitive perspective on risk taking. *Management Science, 39(1),* 17-31.

Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica, 47,* 263-291.

Kahneman, D., & Tversky, A. (1984). Choices, values and frames. *American Psychologist, 39(4),* 341-350.

Kahneman, D., & Tversky, A. (2000). *Choices, values and frames.* New York: Cambridge UP.

Kahneman, D., Knetsch, J., & Thaler, R. (1991). Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias. *Journal of Economic Perspectives, 5,* 193-206.

Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases.* New York: Cambridge University Press.

Katona, G. (1951). *Psychological analysis of economic behavior.* New York: McGraw Hill.

Katona, G. (1975). *Psychological economics.* New York: Elsevier.

Kennickell, A. (1995). *Saving and permanent income: Evidence from the 1992 Survey of Consumer Finances.* Retrieved July 13, 2003, from http://www.federalreserve.gov/pubs

Kennickell, A.B., Starr-McClure, M., & Sunden, A. E. (1996). *Saving and financial planning: Some findings from a focus group.* Retrieved September 18, 2003, from http://www.federalreserve.gov/pubs

Kennickell, A.B. (1998). *Multiple imputation in the Survey of Consumer Finances. Proceedings of the section of survey research methods.* Retrieved August 3, 2003, from http://www.federalreserve.gov/pubs

Kennickell, A. (1999). *Using Income Data to Predict Wealth.* Retrieved September 20, 2003, from http://www.federalreserve.gov/pubs

Kennickell, A. (2001). *An examination of changes in the distribution of wealth from 1989 to 1998: Evidence from the Survey of Consumer Finances.* Retrieved July 23, 2003, from http://www.federalreserve.gov/pubs

Kennickell, A.B., Starr-McClure, M., & Surette, B.J. (2000). Recent changes in U.S. family finances: Results from the 1998 Survey of Consumer Finances. *Federal Reserve Bulletin, 86,* 1-29.

Keynes, J.M. (1936). *The general theory of employment, interest and money.* London: Harcourt Bruce Jovanovich.

King, M. (1985). The economics of saving: A survey of recent contributions. In S. Honkapohja & K. A. Arrow (Eds.) *The frontiers in economics.* New York: Blackwell.

Kotler, P. (1997). *Marketing management.* New York: Prentice-Hall, Inc.

Landsberger, M. (1966). Windfall income and consumption: comment. *American Economic Review, 56,* 534-539.

Lindqvist, A. (1981). The saving behavior of households. Stockholm: Doctoral dissertation, Stockholm School of Economics.

Lopes, L. (1994). Psychology and economics: Perspectives on risk, cooperation, and the marketplace. In M.P. Zanna (Ed.) *Annual Review of Psychology, 45,* 197-227.

Lunt, P.K., & Livingstone, S. M. (1992). *Mass consumption and personal identity: Everyday economic experience.* Buckingham, UK: Open University Press.

Mackenzie, C. (1997). Where are the motives? A problem with evidence in the work of Richard Thaler. *Journal of Economic Psychology, 18(1),* 123-135.

Mayer, T. (1972). *Permanent income, wealth and consumption: A critique of the permanent income theory, the life-cycle hypothesis, and related theories.* Berkely, CA: UC Press.

Modigliani, F. (1985). Life cycle, individual thrift and the wealth of nations. Retrieved March 14, 2004 from: http://www.nobel.se/economics/laureates/1985/index.html

Modigliani, F., & Brumberg, R. (1954). Utility analysis and the consumption function: An interpretation of cross-section data. In K.K. Kurihara (Ed.), *Post Keynesian economics.* New Brunswick, NJ: Rutgers University Press.

Odean, T. (1998). Are investors reluctant to realize their losses? *Journal of Finance, 53,*1775-

1798.

Pope, C., Ziebland, S., & Mays, N. (2000). Qualitative research in health care : Analyzing qualitative data. *British Medical Journal, 320,* 114-116.

Poterba, J. M. (1994). *International comparisons of household saving.* Chicago: U of Chicago.

Poterba, J. M., Venti, S.F., & Wise, D.A. (1994). Targeted retirement savings and the net worth of elderly Americans. *American Economic Review, 84(2),* 180-185.

Prelec, D., & Loewenstein, G. (1998). The red and the black: Mental accounting of savings and debt. *Marketing Science, 17,* 4-28.

Richie, J., & Spencer, L. (1994). Qualitative data analysis for applied policy research. In A. Bryman and R. Burgess (Eds.) *Analyzing qualitative data.* New York: Routledge (pp 173-194).

Rothschild, M. (1991). Comment on S.F. Venti and D.A. Wise. The saving effect of tax-deferred retirement accounts. In B.D. Bernheim and J.B Shoven *National saving and economic performance* (pp.128-130). Chicago: University of Chicago Press.

Russo, J.E., & Schoemaker, P.J.H. (1989). *Decision traps.* New York: Fireside.

Schmidt-Hebbel, K., & Serven L. (1999). Saving in the world: The stylized facts. In K. Schmidt-Hebbel & L. Serven *The economics of saving and growth: Theory, evidence and implications for policy* (pp. 6-32). New York: Cambridge University Press.

Schmidt-Hebbel, K., & Serven, L. (1999). Aggregate saving and income distribution. In K. Schmidt-Hebbel & L. Serven *The economics of saving and growth: Theory, evidence and implications for policy* (pp. 147-188). New York: Cambridge University Press.

Schor, J. B., (1998). *The overspent American: Why we want what we don't need.* New York: Harper Perennial.

Shafir, E., Diamond, P., & Tversky, A. (1997). Money illusion. *The Quarterly Journal of Economics, 112(2),* 341-374.

Shanteau, J. (1992). The psychology of experts: An alternative view. In G. Wright & F. Bolger

(Eds.), Expertise and decision support, (pp. 11-23). New York: Plenum Press.

Shefrin, H.M., & Statman, M. (1985). The disposition to sell winners too early and ride losers too long. *Journal of Finance, 40*, 777-790.

Shefrin, H.M., & Thaler, R.A. (1988). The behavioral-life cycle hypothesis. *Economic Inquiry, 26*, 609-643.

Sherraden, M., & Beverly, S. G. (2000). Can the poor save? Theory, evidence, and questions. In M. Sherraden et al. (Eds.) *Down payments on the American dream policy demonstration: A national demonstration of Individual Development Accounts.* St. Louis: Center for Social Development.

Simon, H. (1982). *Models of bounded rationality*. Cambridge, MA: MIT Press.

Skinner, J. (1989). Housing wealth and aggregate saving. *Regional Science and Urban Economics, 19(2)*, 305-324.

Stanley, T., & Danko, W. (1996). *The millionaire next door: The surprising secrets of America's wealthy.* New York: Pocket Books.

Sullivan, T.A., Warren, E., & Westbrook, J.L. (2000). *The fragile middle class*. New Haven, CT: Yale University Press.

Sunden, A.E., & Surette, B.J. (1998). *Gender differences in the allocation of assets in retirement savings plans*. Washington, DC: Federal Reserve Board.

Tabachnick, B. G., & Fidell, L. S. (1989). *Using multivariate statistics*. New York: Harper Collins.

Tin, J. (2000). Life-cycle hypothesis, propensities to save, and demand for financial assets. *Journal of Economics and Finance, 24*, 110-121.

Thaler, R.H. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization, 1*, 39-60.

Thaler, R.H. (1985). Mental accounting and consumer choice. *Marketing Science, 4*, 199-214.

Thaler, R.H. (1990). Saving, fungibility, and mental accounts. *Journal of Economic*

Perspectives, 193-205.

Thaler, R.H. (1992). *The winner's curse: Paradoxes and anomalies of economic life*. New York: Free Press.

Thaler, R.H. (1994). Psychology and savings policies. *American Economic Review, 84 (2)*, 186-192.

Thaler, R.H. (1999a). Mental accounting matters. *Journal of Behavioral Decision Making, 12 (3)*, 183-206.

Thaler, R.H. (1999b). The end of behavioral finance. *Financial Analysts Journal, 55,* 12-17.

Thaler, R., & Bentarzi, S. (2001). Naive diversification in defined contribution savings plans. *American Economic Review, 91, 79-98.*

Thaler, R.H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy, 89*, 392-405.

Thaler, R.H., & Johnson, E.J. (1990). Gambling with house money and trying to break even: The effects of prior outcomes on risky choice. *Management Science, 36,* 643-660.

Trope, Y. (1986). Identification and inferential processes in dispositional attribution. *Psychological Review, 93,* 239-257.

Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of Business, 59(4)*, S251-S278.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211*, 453-458.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *Quarterly Journal of Economics, 106*, 1034-1061.

Venti, S.F., & Wise, D.A. (1987). *Have IRAs increased U.S. saving?: Evidence from Consumer Expenditure Surveys*. National Bureau of Economic Research, Working paper #2217.

Venti, S.F., & Wise, D.A. (1989). *But they don't want to reduce housing equity.* National Bureau of Economic Research, Working paper #2859.

Venti, S.F., & Wise, D.A. (1991). The saving effect of tax-deferred retirement accounts. In B.D. Bernheim and J.B Shoven (Eds.), *National saving and economic performance* (pp. 103-128). Chicago: University of Chicago Press.

Von Neumann, J., & Morgenstern, O. (1947). *Theory of games and economic behavior.* Princeton, NJ: Princeton University Press.

Wahlund, R. & Gunnarson, J. (1996). Mental discounting and financial strategies. *Journal of Economic Psychology, 17,* 709-730.

Warneryd, K.E. (1999). *The psychology of saving.* Cheltenham, UK: Edward Elgar.

Weil, D.N. (1991). What determines saving? A review essay. *Journal of Monetary Economics, 28,* 161-170.

Weiner, B. (1985). At attributional theory of achievement motivation and emotion. *Psychological Bulletin, 97,* 74-84.

Wells, C. D. (2001). An integrative model of psychological and economic factors to better predict consumer saving behavior: Theoretical foundations and an empirical investigation. *Dissertation Abstracts International, 61(7),* 2819. (UMI No. 9978358)

Wilcox, D.W. (1989). Social Security benefits, consumption expenditure and the life-cycle hypothesis. *Journal of Political Economy, 97,* 288-304.

Wolff, E. N. (2000). Who are the rich? A demographic profile of high-income and high-wealth Americans. In J. B. Slemrod (Ed.) *Does Atlas shrug? The economic consequences of taxing the rich.* Cambridge: Harvard University Press and Russell Sage Foundation, 74-113.

Wolkomir, R., & Wolkomir, J. (2000). You are what you buy. *Smithsonian, 31(7),* 102-109.

Appendix A
INFORMED CONSENT FORM

Purpose:
The purpose of this research is to examine how people make decisions to save for the future. Any findings of this study will be used to help improve individuals' ability to save.

Description:
You will be asked to participate in a personal interview lasting approximately 45 minutes with 22 questions regarding your views on saving. Of interest is how you approach saving decisions. There are no wrong or right answers. Your responses will be tape-recorded to ensure an impartial and accurate record. To maintain anonymity and confidentiality no information that identifies you (name, address, phone, etc.) will be collected nor stored with data – all interviews will be referenced with a case number. The recordings will be converted to a CD and the answers coded into a spreadsheet for analysis. This CD and spreadsheet will be kept by the researcher for 5 years per guidelines of the American Psychological Association and not shared. No personal risks or discomforts are anticipated in answering these questions, and you can discontinue participation at any time. In return for assisting in this research, a personal comparison of your responses versus responses of American averages will be provided.

Other Elements:
You understand that the use of human subjects has been approved by the University of New Hampshire (UNH) Institutional Review Board for the protection of subjects in research.

You understand the scope, aims, and purposes of this research project and the procedures to be followed and the expected duration of your participation.

You understand that your consent to participate in this research is entirely voluntary, and that your refusal to participate will involve no prejudice, penalty or loss of benefits to which you would otherwise be entitled.

You further understand that if you consent to participate, you may discontinue your participation in this research project.

You understand that you will not be provided financial incentive for your participation by UNH.

You confirm that no coercion of any kind was used in seeking your participation in this research project.

You understand that any information gained about you as a result of your participation will be provided to you at the conclusion of your involvement in this research project.

You certify that you have read and fully understand the purpose of this research project and the risks and benefits it presents to you as stated above.

I, _____ CONSENT/AGREE to participate
Print name

I, _____ REFUSE/DO NOT AGREE to participate
Print name

_____
Signature Date

Questions:
Any questions or concerns regarding the research can be addressed to the researcher Thomas Van De Water. If you have any questions about your rights as a subject participating in this project, you may call Julie Simpson at the Office of Sponsored Research, phone 603-862-2003 for information.

Appendix B

PERSONAL SAVING INTERVIEW

Thanks for agreeing to participate. Before we get started, could I get a little personal information? Please complete this section that will be used to create your savings profile by choosing one option or filling in the blank.

1. *Which best describes your saving habits 1) don't save – usually spend more than income, 2) don't save spend as much as income, 3) save whatever is left over at the end of the month – no regular plan, 4) save income of one family member, spend the other, 5) spend regular income, save other income, 6) save regularly by putting money aside each month*
2. *Last year, would you say that your spending was 1) less than, 2) equal to, or 3) more than your income?*
3. *When planning your savings and investments, what type of time horizon do you have? 1) next year, 2) next few years, 3) next 5-10 years, 4) longer than 10 years*
4. *Which best describes the amount of risk you are willing to take when you save or make investments? 1) substantial risks, 2) above-average risk, 3) average risk, 4) no financial risks*
5. *Compared with other people of my generation and background, I have been lucky in my financial affairs. 1) agree strongly, 2) agree somewhat, 3) neither agree or disagree, 4) disagree somewhat, 5) disagree strongly*
6. *What is your age?* _____
7. *What is your occupation?* _____
8. *What is your gender?* *1) male, 2) female*

The rest of the interview consists of discussion questions regarding your views on saving.

9. *What do you think of when I say "saving"?*
    a. *Is saving the same as investing – why or why not?*
    b. *Is saving something that is: internal/external, stable/unstable, controllable/uncontrollable?*
10. *Thinking about your reasons for saving, what sorts of reasons are most important to you?*
11. *Do you feel any moral or ethical obligation to save?* "waste not want not" "neither a borrower nor lender be"
    a. *Why or why not?*
12. *In your view, why do some people save while others do not save?*
13. *What are some of the things you have saved for in the past?*
14. *What types of financial obligations do you see in the future?*
    a. *Are you saving for these expenses now?* 1) yes, 2) no
15. *Would you say that you deliberately plan your savings and investments, or do you make decisions as specific needs or opportunities arise?*
16. *Can you describe any strategies to put aside money for your saving goals?*
    a. *Where did you learn them?*
    b. *Why do you think they work?*
17. *What aspects of your circumstances, experience or personality influence your ability to save?* (Depression, Frugal Yankee)
18. *When planning your savings & investments, how does risk affect your decisions?*
    a. *What types of risk are you concerned about?*
19. *How has your approach to saving changed over time?*
20. *What events or experiences have made you change your approach?*
21. *When you make decisions about your savings and investments, what sources of information do you consult?*
22. *Is there anything else you would like to tell me about your views on saving?*

Appendix C

Institutional Review Board Approval

University of New Hampshire
Institutional Review Board for the Protection of Human Subjects in Research
Departmental Review Committee Exemption Classification Sheet

Name: Thomas Van De Water **IRB #:** _____

Dept: Psychology **Reviewer:** _____

Study: American Saving Patterns: A Multiattribute Segmentation Study1, Study2

Exempt Review

46.101(b)(1) Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as:
_____ (i) research on regular or special educational instructional strategies, or
(ii) research on the effectiveness of or comparison among instructional techniques, curricula, or classroom management methods.

46.101(b)(2) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior unless:
✓ (i) information obtained is recorded in such a manner that human subjects can be identified, directly or through identifiers linked to the subjects; and
(ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to subjects' financial standing, employability, or reputation.

46.101(b)(3) Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior that is not exempt under category (b)(2) if:
_____ (i) the human subjects are elected or appointed public officials or candidates for public office; or
(ii) federal statute(s) require(s) without exception that confidentiality of the personally identifiable information will be maintained throughout the research and thereafter.

46.101(b)(4) Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens, if these sources are publicly available or if the information is recorded by the
X investigator in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects.

46.101(b)(5) Research and demonstration projects which are conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine: (i) public benefit or
_____ service programs; (ii) procedures for obtaining benefits or services under those programs; (iii) possible changes in or alternatives to those programs or procedures; or (iv) possible changes in methods or levels of payment for benefits or services under those programs.

46.101(b)(6) Taste and food quality evaluation and consumer acceptance studies, (i) if wholesome foods without additives are consumed or (ii) or if a food is consumed that contains a food ingredient at or below the
_____ level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration, or approved by the Environmental Protection Agency, or the Food Safety and Inspection Service of the U.S. Department of Agriculture.

_____ **Protocol is approved as presented in the category checked**
_____ **Protocol is approved with the following contingencies/comments (attach sheets if necessary)**
_____ **Protocol is referred to the IRB for Expedited or Full Board review**
_____ **Protocol cannot be approved as presented (cite reasons on separate sheet)**

DRC Reviewer: John Limber **Date:** 5/07/04 (originally approved 3/13/2003)